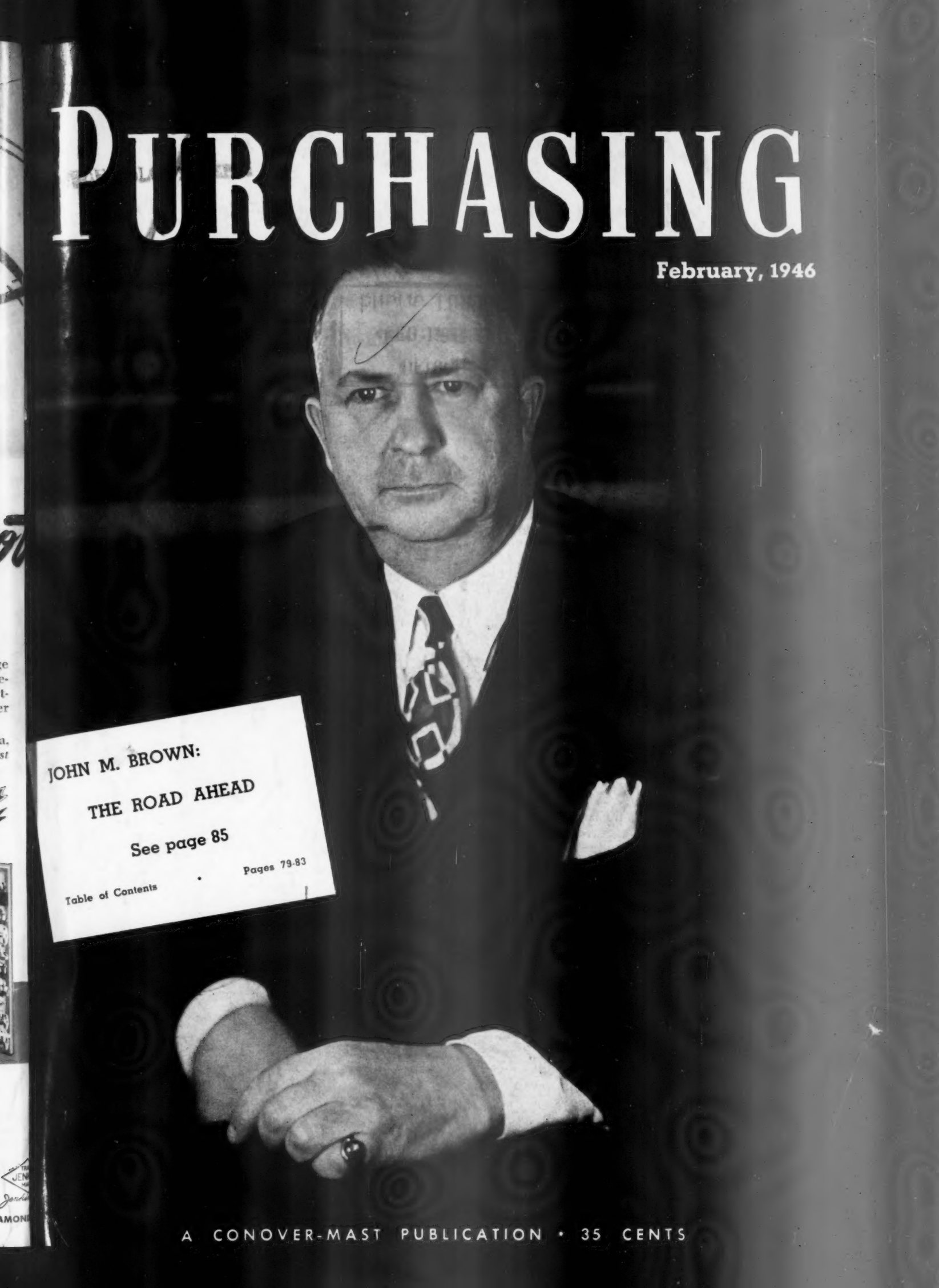
PURCHASING

February, 1946



JOHN M. BROWN:

THE ROAD AHEAD

See page 85

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Effective Lubrication means Faster Production, Lower Costs

YOU use airplanes to move goods faster. Why not use improved lubrication to *make* your goods faster—at lower cost?

Texaco Products and Texaco Specialized Engineering Service are an unbeatable team for keeping your production rolling smoothly at peak output. They bring you three great advantages:

1. Improved, service-tested lubricants—a complete line to meet every requirement.
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3. Improved facilities, nationwide, to provide dependable delivery service wherever you are located.

Throughout industry, in plants of every type, Texaco is preferred for its proved effectiveness in increasing production and reducing costs. Texaco can do as much in your plant.

To find out what Texaco Products and Texaco Lubrication Engineering Service can do for you, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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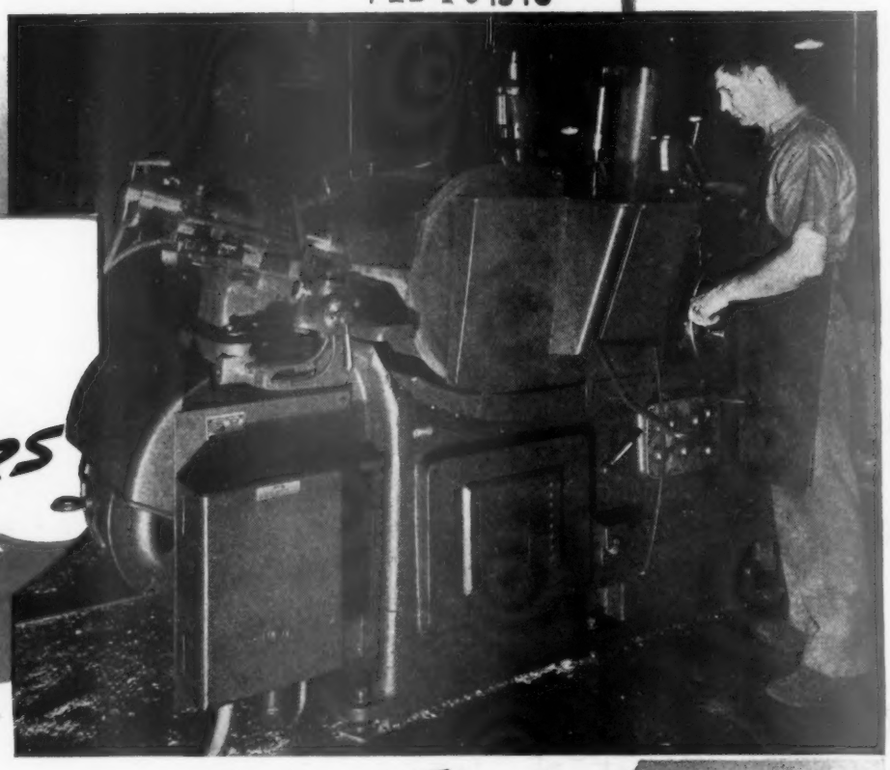

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Centerless grinder driven by a Century 30 horsepower 3 phase motor.

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Century Motors may be a vital factor in producing a better product at a lower cost — Specify Century.

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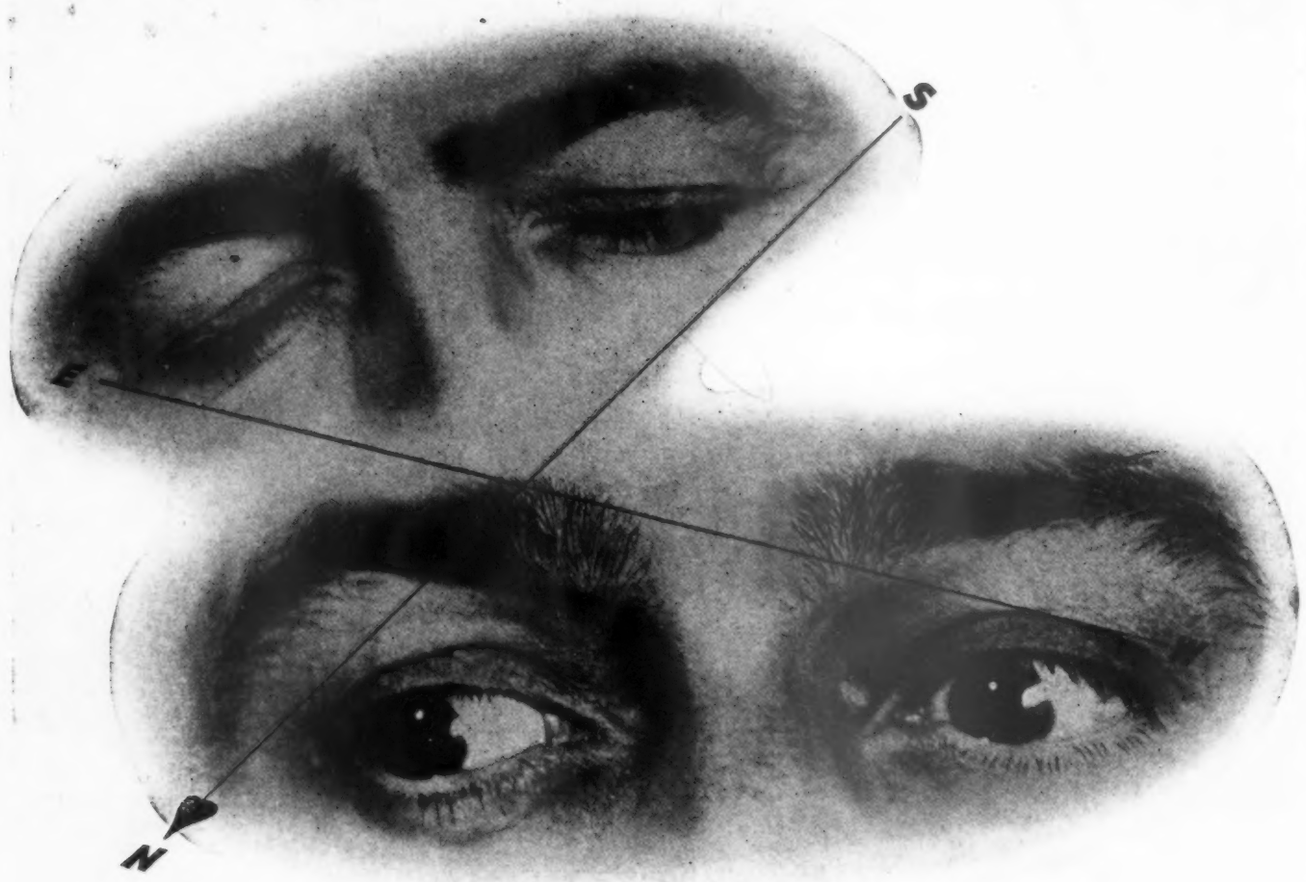
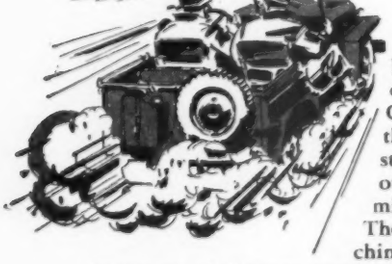
RCHASING, published monthly by Conover-Mast Company. Publication Office, Orange, Conn. Editorial and Executive Offices, 205 East 42nd St., New York 17, N. Y. Entered as second-class matter August 8, 1942, at the Post Office in Orange, Conn., under the act of March 3, 1879, Subscription, $3 for one year, $5 for two years in the U. S. A. Canada and Foreign $4.00. Volume 20, No. 2.



HOW TO MAKE A MAP

with 4 "Mathematical Eyes" and a Jeep!



Do it the way Yank jeeps did it in Italy, France and Germany, when they used this equipment to navigate straight to enemy objectives over night-hidden or unfamiliar highways and terrain. They used this uncanny machine called an "odograph" (measurer of distance travelled), which consists of three parts: Magnetic compass with electronic follower . . . plotting unit with map table, tracing pencil, and Veeder-Root Mileage Counters . . . and a power pack operating from storage batteries. This odograph can plot maps from any scale of 1:200,000 to 1:500,000.

Actuated by a beam of light projected into the compass bowl and reflected from a mirror at the center of the compass card, the Veeder-Root mileage counters indicate the distance travelled east and west or north and south of a given starting point. And when two of these "Mathematical Eyes" are counting the miles travelled, say, northeast . . . then the other two eyes are electronically shut and do not count at all. Yet a total is registered of miles travelled in *any* direction. So a set course can be checked . . . or an unmapped course can be mapped . . . by this eerie equipment which needs no information beyond its original bearing, and which can see through walls of steel and dark of night. It always provides an accurate spot-location in land miles, in any direction, from the given starting point. *The map is plotted as you ride!* There are other features which had the Huns talking to themselves. And the peacetime uses you can figure for yourself!

All that remains to be said here is that this is another of the unlimited and unpredictable uses to which men of imagination can put Veeder-Root Counting Devices. These devices can be applied, in ways just as unheard-of as this, to hosts of products now in use or still on the drafting boards. For Veeder-Root Devices can be built-in as integral parts of any product . . . to provide continuous *Count*rol over performance or production . . . or to provide proof of performance-guarantee. So take *Count*sel now with Veeder-Root engineers, and let them open *your* "Mathematical Eyes" to new possibilities for *your* product.

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VEEDER-ROOT INC.

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In England: Veeder-Root Ltd. (New address on request)

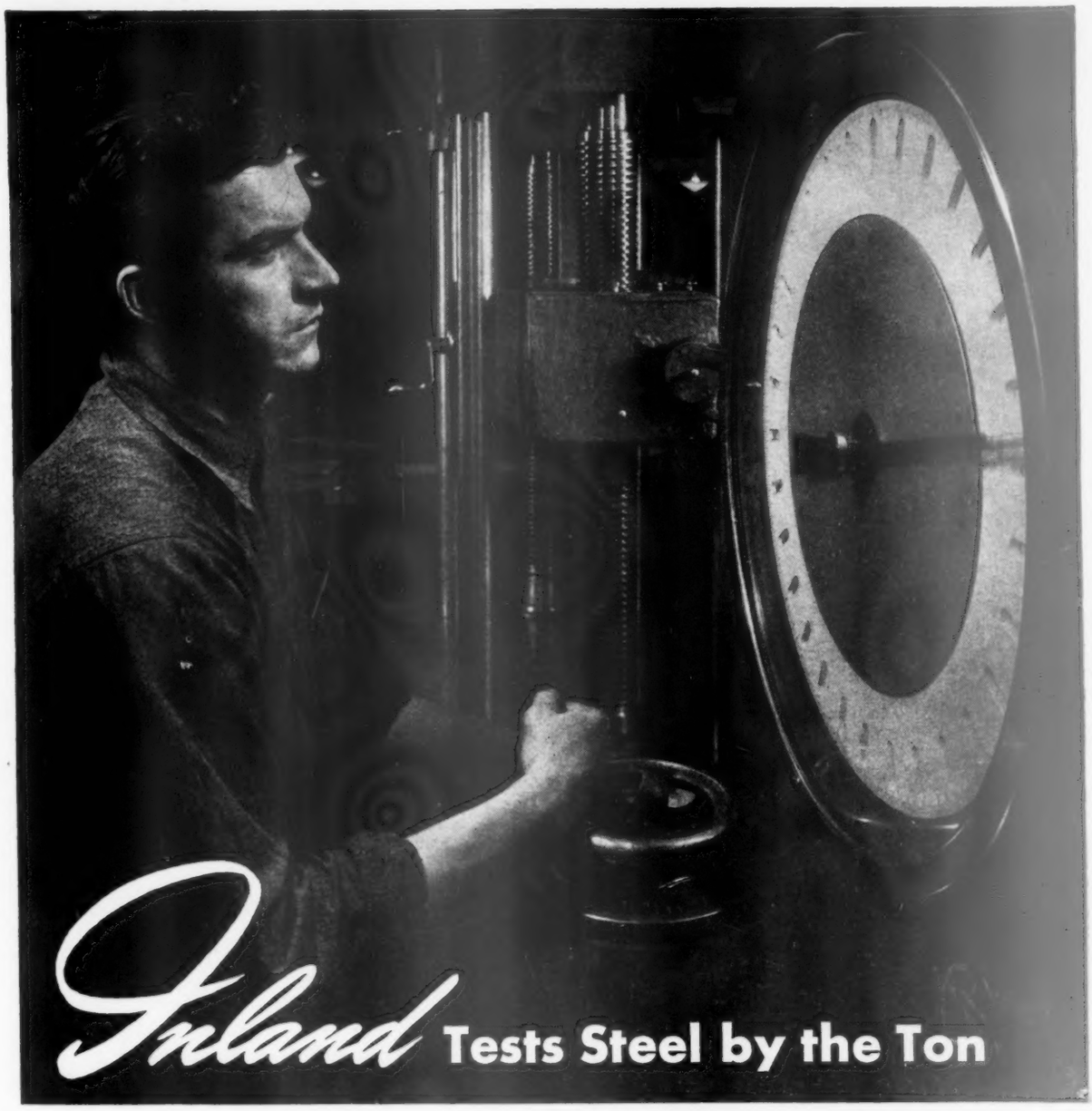
Special duty trucks gather steel samples for the laboratory.

A truck is unloaded at the laboratory, and immediately starts another round trip.

Plate samples are punched to rough form, then milled. Others are sawed, turned, drilled, etc., as required.

Many samples undergo rigid chemical tests.

Metallurgical tests are extremely important for quality control.



Inland Tests Steel by the Ton

Operator determining physical properties on one of the many tensile testing machines in the Inland laboratory.

Darting from mill building to mill building—many times a day, and at night—are Inland trucks on special duty, a duty of vital interest to every user of Inland steel.

They are the sample trucks which rush samples of Inland products to the main laboratory where all required tests must be completed, reported and checked against specifications before steel is shipped.

Samples are gathered for the laboratory at semi-finishing mills—pieces from billets, slabs, etc., that will be tested before the steel is rolled into final form. Also collected are samples of finished products. Depending upon requirements, every piece of steel delivered to the Inland laboratory undergoes rigid physical, chemical, and metallurgical tests. Many of these tests are special developments by Inland—tests that are fast and extremely accurate.

Yes, Inland daily tests tons and tons of steel to assure every customer that his order will measure up to every requirement.

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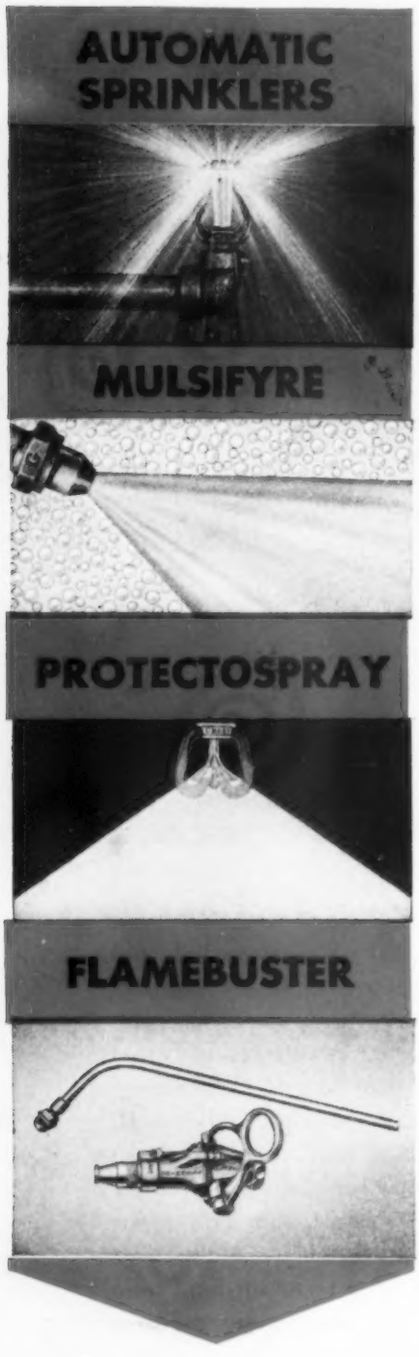
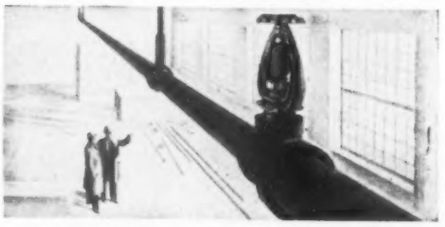
FIRE PROTECTION

Engineered to Meet All Hazards



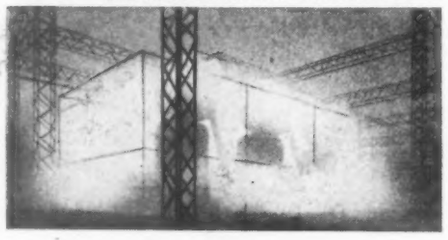
FOR ORDINARY RISKS · · · · ON GUARD 24 HOURS A DAY

Grinnell Automatic Sprinkler Systems protect over 70 billion dollars' worth of property. When fire occurs, heat causes the sprinkler head above it to open at a predetermined temperature and release a deluge of water on the fire.



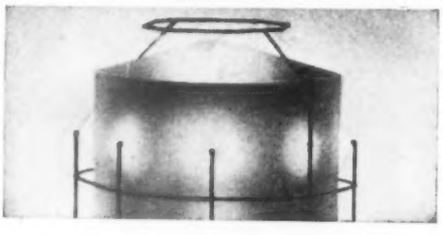
FOR FLAMMABLE LIQUIDS · · · · PROTECTS 20,000,000 KVA TRANSFORMER CAPACITY

Grinnell Mulsifyre Systems extinguish fires in flammable liquids. Widely used to protect transformers, oil lines, quench tanks and bilges of oil-burning ships. A permanent piping system equipped with either high or low velocity heads. Water spray converts burning liquid into an emulsion incapable of burning.



FOR PROTECTION BY COOLING · · · · SAFEGUARDS TANKS OF EXPLOSIVE MIXTURES

Grinnell ProtectoSpray System protects tanks when exposed to adjacent fires. A fine water spray cools the tank surface, effectively preventing rapid evaporation and the development of bursting pressures.



FOR MANUAL FIRE-FIGHTING · · · · KILLS OIL FIRES FAST

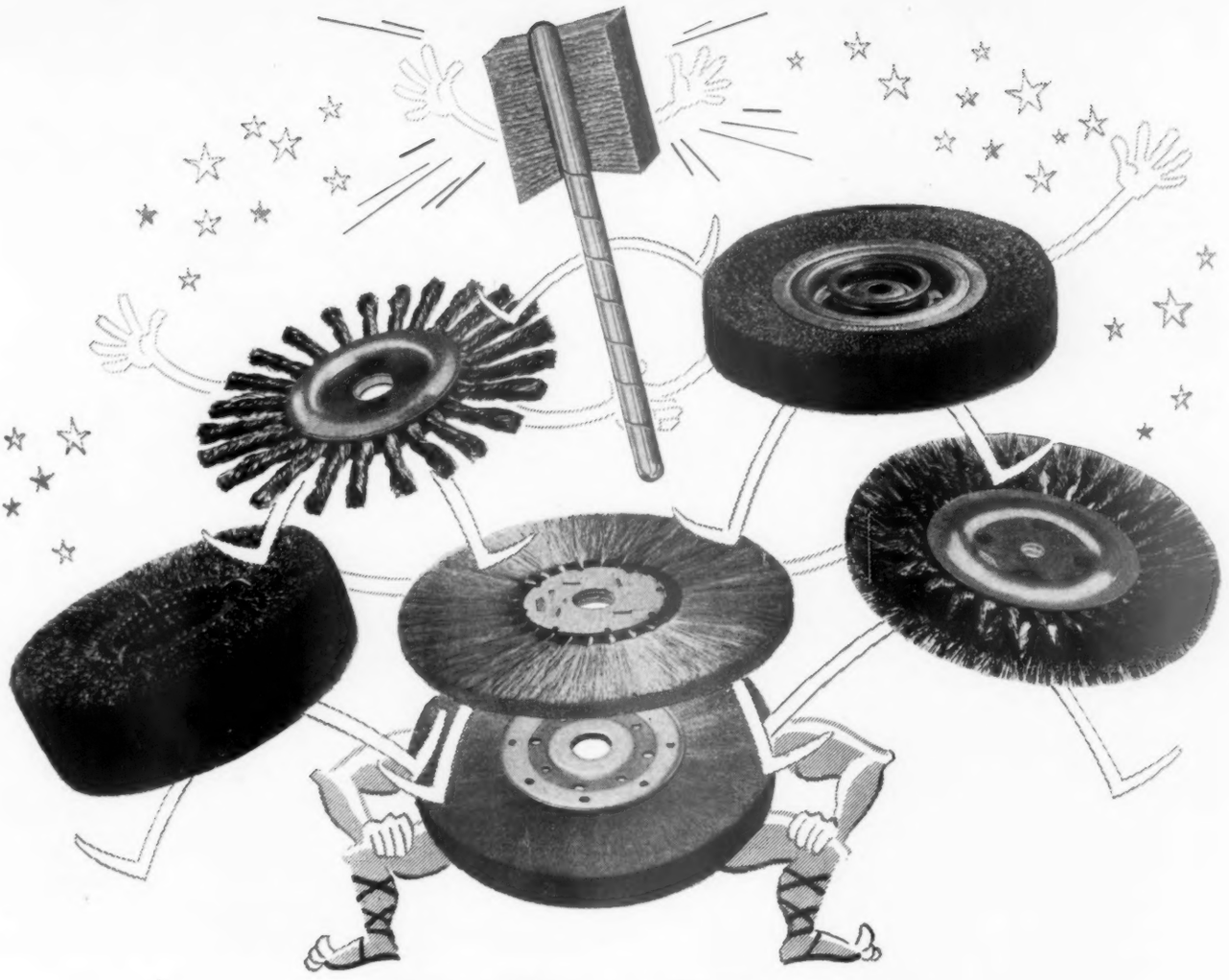
Grinnell FlameBuster is a three-purpose portable hoze nozzle. Low velocity spray, from 4′ or 10′ applicator, for stubborn fires in light, flammable liquids; high velocity spray for fires in heavier oils; and solid stream for mopping up operations.

For complete information on any of these systems, write Grinnell Co., Inc., Executive Offices, Providence 1, R. I. Branch offices in principal cities.

GRINNELL

FOUNDED 1850

***ENGINEERED* FIRE PROTECTION**



A New Performer

has been added to the world's leading family of best-performing brushes

THE outstanding performances of Osborn brushes—whether they be Master Wheels or Monitors or Disc Center Sections—have won the plaudits of the industrial world.

Now a new performer has been added to the Osborn lists—a power brush like none you ever saw before! It's called the SITUFT. It was developed by Osborn engineers in the last months of the war—and it literally performed miracles of production.

The Situft is built on an entirely new principle of wire suspension. It can do jobs no other brush (in some cases, no other tool) could ever do before. Its cost is almost unbelievably low—17¢ per brush—yet it has saved thousands of dollars in production costs—**cleaning, deburring and surface finishing internal, hard-to-get-at places.** A complete tool crib kit containing one each of all 12 sizes (¼" to 1¼") and 2 holders costs $2.85. You ought to have one. Kits and open stock available from your local Osborn distributor.

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue *Cleveland, Ohio*

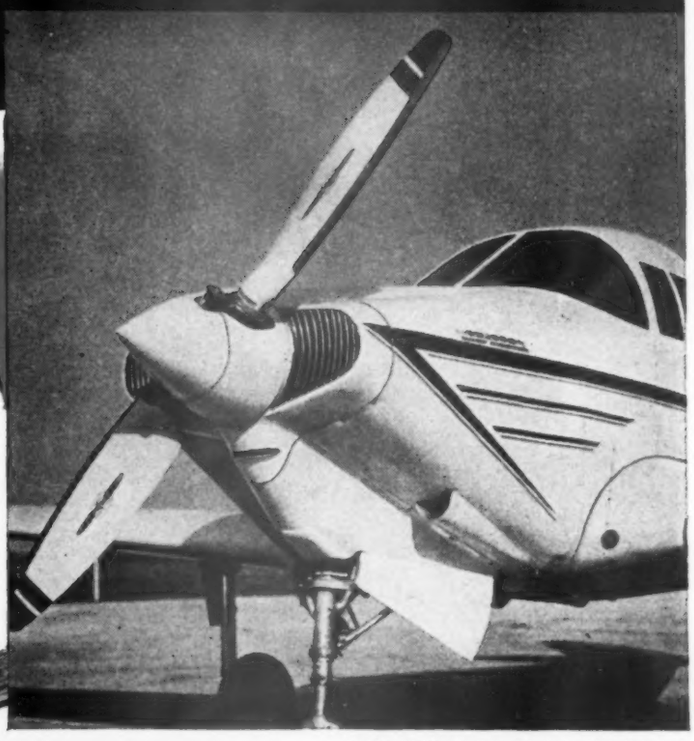
AEROMATIC AIRCRAFT

PROPELLER DESIGN REVOLUTIONIZED WITH WALDES TRUARC RETAINING RINGS

MEMO

KOPPERS CO., INC.
Aeromatic Aircraft Propellers

RE: WALDES TRUARC RETAINING RINGS
✓ Maximum thrust load of 30,000 lbs.
✓ Save at least 10% in weight
✓ Heavy nuts are discarded
✓ Hub threading, drilling and machining reduced to 1 ring groove alone.
✓ Makes hub assembly self-locking
✓ Time savings of 75% in assembly and disassembly



AEROMATIC AIRCRAFT PROPELLERS are standard equipment on the Rocket 185, illustrated above.

1

BEFORE TRUARC—

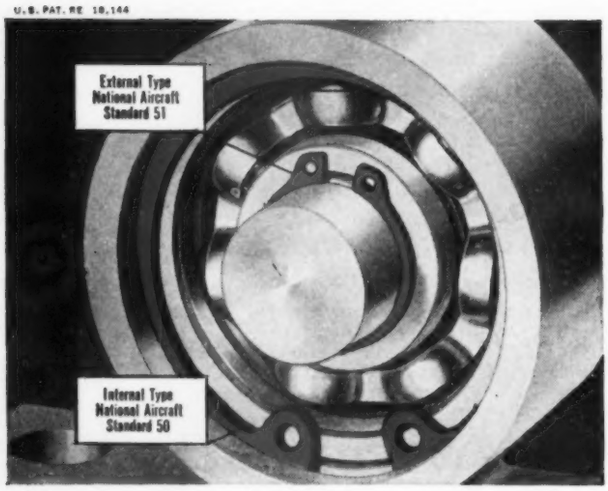
High centrifugal loads generated by whirling blades of automatic variable pitch propellers were borne by a buttress-threaded nut screwed into the hub. This meant expensive machining, extra weight.

2

AFTER TRUARC—

Elimination of conventional nut greatly reduced weight—cut machining time and cost 75% — made overall maintenance easier. Truarc retention strength against tons of centrifugal force is 3 times greater than operating load.

U.S. PAT. RE 18,144



Waldes Truarc Retaining Rings are used to save weight, space, cost and time in a wide range of products. For holding and positioning machine parts they offer definite advantages over nuts, shoulders, collars and pins. They simplify and speed up production. They can be put on and taken off again and again—and still retain the perfect circularity which gives them their never-failing grip. Test them yourself. We'll furnish samples and complete data. Write Dept. W-2.

WALDES TRUARC TRADE MARK **RETAINING RINGS**

WALDES KOHINOOR, INC., LONG ISLAND CITY 1, NEW YORK

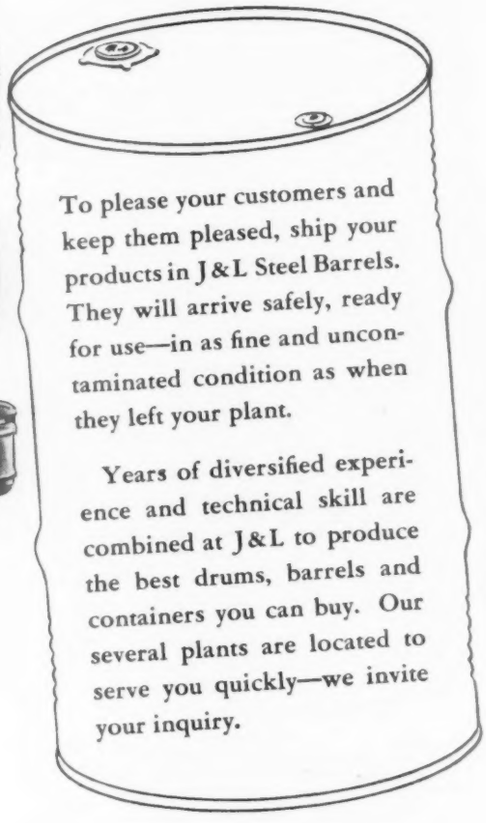
CANADIAN REPRESENTATIVES: PRENCO PROGRESS CORP., LTD., 72-74 STAFFORD ST., TORONTO

YOUR PRODUCT IS THE BEST...

SHIP IT IN THE BEST...

SHIP IN J&L STEEL

BARRELS AND DRUMS



To please your customers and keep them pleased, ship your products in J&L Steel Barrels. They will arrive safely, ready for use—in as fine and uncontaminated condition as when they left your plant.

Years of diversified experience and technical skill are combined at J&L to produce the best drums, barrels and containers you can buy. Our several plants are located to serve you quickly—we invite your inquiry.

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NO. KANSAS CITY, MO. · PHILADELPHIA, PA. · PORT ARTHUR, TEXAS · ST. LOUIS, MO.

J&L STEEL

GET THIS "Know-How" Information FOR YOUR PLANT

USE COUPON BELOW

☐ **1. PLIOBOND**—Plastic adhesive that "Bonds Anything to Anything". Manual issued by United States Plywood Corp., Industrial Adhesives Divn. provides information you should have about the unique qualities of this adhesive. It tells about types of bonds possible, general properties of Plibond such as bond strength, durability, chemical and solvent resistance, durability, etc., preparation of surfaces, etc. This booklet may help you to solve a tough adhesive or assembly problem.

☐ **2. PALLET For Material Handling**—New booklet issued by General Box Company deals with the use of pallets in materials handling, and tells about Generalift pallets skids and lift boxes. It contains worthwhile information for those using pallets or planning to do so.

☐ **3. VALVE REPAIR RECORD Sheets**—Valve Inspection and Retirement plan has been developed by engineers of Jenkins Bros. They have devised inspection sheets for Gate, Check, and Globe, Angle & Y Valves, which are furnished without cost in file folder bearing printed instructions. It is felt that proper use of the plan will eliminate operating losses and increase plant efficiency. Check No. 3 and indicate the approximate number of valves to be checked.

☐ **4. BRUSHES and BRUSHES**—"Know Your Brushes" is subject of catalog issued by The Solo-Horton Brush Co., Inc., which is claimed to illustrate and describe the most complete line of brushes offered today. Over 1500 brushes for industry and the fine arts are included. It is indexed at the side for quick reference to different types.

☐ **5. COLOR FOR INDUSTRY**—Reconversion and plant rehabilitation means painting. You should have a copy of "Color for Industry" issued by the U. S. Gutta Percha Paint Co. It tells about the partnership of light and paint in prolonging and promoting the efficiency of workers.

☐ **6. TAGS, LABELS, SEALS, PACKAGING**—Fastening tags, labels that stick, informative labels, instruction labels, and tags. Dennison Company has printed matter that may help you solve some of your buying problems along these lines, and booklet "If you Could Only Be at Every Point of Sale" that should be of interest to your sales and advertising departments. Dennison Manufacturing Company.

☐ **7. PLASTICS**—"The Story of an Industry". Booklet prepared under the direction of the Committee on Plastics Education of the Society of the Plastics Industry was developed to answer numerous questions about the varied types of plastics, methods of molding, etc. It outlines the principal classes, their characteristics and uses.

☐ **8. ARC WELDING**—Up-to-date catalog of Airco arc welding accessories has been published by Air Reduction. This 12-page booklet illustrates and describes a complete line of accessories for all types of arc welding machines and operations. Section is devoted to Airco Heliwelding equipment developed for welding magnesium.

☐ **9. CLEANING PROBLEMS**—Turo Products Inc. will send you 28-page booklet, with airplane portraits in full color, 8" x 11". It describes chemical processes and materials now available in solving production and maintenance problems in industry, such as corrosion, prevention, paint removal, preparation of aluminum surfaces, engine overhaul, surface coatings, cleaning transparent plastics, etc. You may have sufficient number of copies for your engineers and general maintenance men.

☐ **10. GAGES**—Interesting 32-page, pocket sized booklet has been published by Abdite Gauge Co. Its pages are devoted mainly to a compilation of information published by the National Bureau of Standards, and includes numerous diagrams and charts of A.G.D. Standards.

☐ **11. ALUMINUM & MAGNESIUM Castings**—Bulletin issued by the Aeroloy Company lists numerous products for which magnesium castings can be used, and contains table showing physical qualities of magnesium, aluminum, yellow brass, iron and steel.

☐ **12. FRACTIONAL PUMPS** — Coolants, Oils—Bulletin describes Gray-Mills fractional H. P. pumps, portable coolant systems, and parts cleaning systems. Portable controlled-flow coolant systems are designed for all machine tools, applying coolant directly to cutting tools. Superflo centrifugal pumps for coolants, cutting oils and lubricants are also described. Gray-Mills Co.

☐ **13. TAP THREADING MANUAL** — You should have a copy of this very practical Tap Catalog and Threading Manual. An unusual feature is series of lubrication tables which lists the lubricants recommended by each of 17 major oil companies for 86 different types of metals, and cutting speeds. Book is wire-bound and illustrates and provides complete information on sizes, prices, discounts, tolerances and thread limits. Threading manual covers 63 classifications and contains complete Class of Fit information. The Hy-Pro Tool Co.

☐ **14. ARC WELDING ELECTRODES** — "Arc Welding Electrodes" is title of new 32-page illustrated catalog published by Wilson Welder & Metals, Inc., designed to guide electrode users in the selection of the right electrodes for any specific job. Electrodes are recommended for use on mild steel, alloy steels, low alloy high tensile steel and stainless steels; non ferrous metals such as aluminum bronze, aluminum, and manganese bronze.

☐ **15. LABORATORY WARE** — "Alundum Laboratory Ware" is title of booklet issued by Norton Company, devoted mainly to Alundum (refractories made from fused alumina) ware, designed for use in chemical and physical laboratories. Pure white Alundum is used in making the ware.

Continued on page 12

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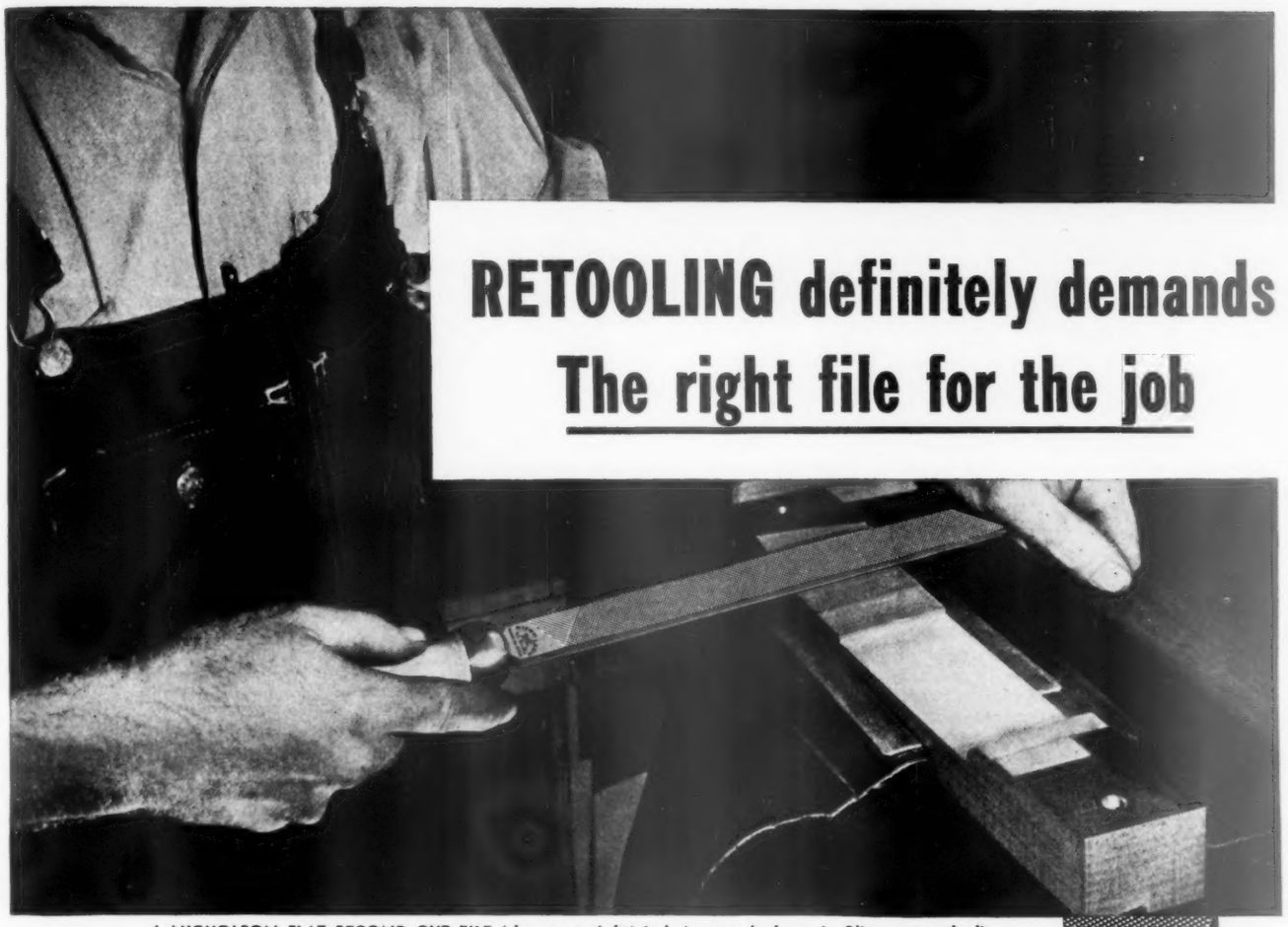
2/46

FOUR PAGES OF "KNOW HOW"—10-12-14-16



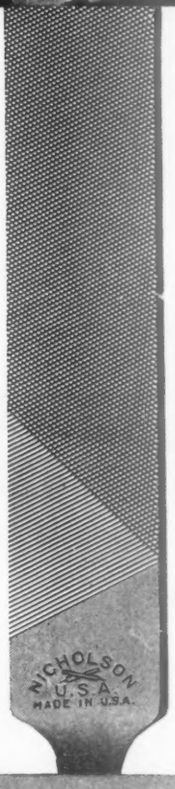
RETOOLING definitely demands The right file for the job

A NICHOLSON FLAT SECOND CUT FILE (shown at right) is being used above in filing a punch die

DIES, jigs, fixtures, gauges, cams, trips, holders, spindles—the closer the tolerances to be worked out by hand, the more careful should be the selection of files . . . Second Cut files instead of Coarse or Bastard; Smooth instead of Second Cut; Swiss Pattern or Special Purpose instead of Regular; etc.

Nicholson is virtually a "file engineering laboratory"—an establishment where the requirements of files for different purposes and metals are a never ending study. Right now, setting up production lines and machines under reconversion programs is making pressing demands on tool and die shops; and the Nicholson factories are taking into full account the files such activity calls for.

Consult your mill-supply house on the files you need both for retooling and for product manufacture. On particularly knotty filing problems, write us direct—and freely.



NICHOLSON U.S.A. **NICHOLSON FILE CO. • 28 ACORN ST., PROVIDENCE 1, R. I.** BLACK DIAMOND TRADE MARK
(In Canada, Port Hope, Ont.)

NICHOLSON FILES *FOR EVERY PURPOSE*

"Know-How" Information, Continued

USE COUPON ON EACH PAGE

☐ **16. SILICONES**—How They Are Made and What They Can Do; Test Results of Silicone as Electrical Insulation. **Bulletin** issued by Dow Corning Corporation carries these two article reprints. Silicone Insulation is said to have accomplished what is probably the most revolutionary improvement in electrical insulation since the first motor was built.

☐ **17. NAME PLATES**—A way to save money. Etching Co. of America offers 98-page 11" x 13½" book, "Designs for Name Plates", which gives useful information to buyers and designers of name plates. It illustrates in actual size over 4,500 different shapes and sizes for which dies are available. Name plates are also illustrated in color. Use of shapes shown in book saves cost of new die, and speeds up deliveries. Edition is limited. Check No. 17 now.

☐ **18. ALL-PURPOSE INSPECTION Equipment**—Bulletin 600-1-45 describes the Sheffield Universal Precisionaire in detail. This is an air-flow gage that measures through air velocity instead of pressure. It is used in the checking of all types of small and long bores to very close limits; outside, internal and average diameters, eccentricity, bellmouth, out-of-round, thickness, straightness, as well as the width, length, height and depth. It is available in fide range of amplification from 1000 to 1 to 25,000 to 1. The Sheffield Corporation.

☐ **19. FASTENERS**—136-page catalog issued by Manufacturers Screw Products is termed a "veritable encyclopedia of fastener facts", and it is said to include many unusual features of interest to Purchasing Agents, engineers and others. It quotes net prices instead of list prices. It is divided into twelve indexed sections—Aviation products, machine screws, cap screws, set screws, bolts, studs and rods, nuts, washers, eyelets, rivets, pins, etc. Technical data includes information on screw thread dimensions, weights per thousand units, head dimensions, recommended hole sizes for sheet metal screws, etc.

☐ **20. TUBE FURNACES**—"Unit Package" tube furnaces for temperatures up to 2650 deg. F. are described in new Burrell bulletin. Furnace is completely self-contained, with requisite controls, instruments and accessories, ready for operation when plugged into electrical circuit. Burrell Technical Supply Co.

☐ **21. MIDGET INDUSTRIAL PUMPS**—Reduced costs and trouble-free performance with Midget pumps that fit the job, is the subject of Eastern Midget Industrial Pumps catalog. Catalog describes single stage centrifugal pumps for large flow at heads; double or triple stage pumps for small gear pumps for small volume at high pressure. Pumps are close-coupled to the driving motors which range from 1/30 HP to ¾ HP in various styles and electrical characteristics. Eastern Engineering Co.

☐ **22. RIVETING MACHINES**—New 6-page bulletin illustrates and describes the H. P. Townsend Manufacturing Company's line of riveting machines. Complete charts for ordering parts, specifications, and information on operation of machines, are included.

☐ **23. PLIERS—PUNCHES**—All types of Bernard pliers are illustrated and described in booklet "The Story of Bernard" published by The Wm. Schollhorn Co. The line includes various types of pliers and nippers, punches for belts, loose-leaf punches, staple removers for shop, office and other uses.

☐ **24. GOVERNOR**—New model of governor that is centrifugally controlled is described in 4-page catalog just released by Monarch Governor Co., which includes installation instructions and parts list. Vacuum or centrifugal type of internal combustion engine control now available, packaged complete, for the more popular makes of engines. Monarch Governor Co.

☐ **25. THE HEINRICH HANDNIP** — It's termed handy-man of the shop, for it is a tool that can be used in four operations: (1) outside nibbling; (2) inside nibbling; (3) rod cutting; (4) shearing. Manufacturer states it is a remarkable time and labor saver. Bulletin describes this tool in detail. National Machine Tool Co.

☐ **26. METALLIZING**—12-page bulletin in color describes the new Metco Type Y Metallizing Gun for production metallizing, which is designed, engineered, and built for heavy duty continuous operation, with an absolute minimum of operator attention, and with no regard for hand use. It is said to spray 100% faster at a cost per pound of metal sprayed lower than ever before. It has positive speed control. Metallizing Engineering Co., Inc.

☐ **27. RUBBER PARTS** — New, illustrated catalog has been issued by H. O. Canfield Company, manufacturers of rubber and synthetic rubber products. It covers application of rubber parts in the automotive, aviation, electrical, medical, plumbing and general industrial fields. Molded, die-cut, and extruded parts as well as stock and specialty items are included.

☐ **28. WIRING SYSTEMS**—Industrial, commercial and residential surface wiring systems are described in 64-page catalog published by National Electric Products Corp. It covers entire line of auxiliaries and fittings used in conjunction with each type of surface raceway.

☐ **29. DIESEL ENGINE MACHINE TOOLS** —Pictorial review of "Special Machine Tools for Diesel Engine Metal Working Operations", which will be of interest in all other fields where metal working operations are performed, has just been released by W. F. and John Barnes Co. Book describes various unit-type and special machines designed and built for multiple machining operations on diesel engine components.

☐ **30. INDUSTRIAL X-RAY Equipment** — New 12-page booklet describing "Norelco Industrial X-Ray Equipment" is announced by North American Philips Co., Inc. Equipment is for fluoroscopy, radiography, diffraction, and spectrometery. Charts show for both ferrous and non-ferrous metals, rubber and carbon. There is also an application selector chart.

☐ **31. ABRASIVE BELTS** — Bulletins A22 and A3.2 describe Abrasive Cloth Belts for popular types of sanding and grinding machines, and for wet sanding and wet grinding machines. Buyers will find these bulletins of practical value for they show belt size in inches, belts per carton, makes and models of equipment and list prices per one-unit carton, of popular sizes and grits. Behr-Manning Corp.

☐ **32. SPECIAL CARBIDE TOOLS** — Bulletin 11132 describes Ex-Cell-O carbide special tool applications for reaming, facing, chamfering, drilling, boring, turning, forming, counterboring and milling. Numerous tools are illustrated. Ex-Cell-O Corporation.

☐ **33. ELECTRIC MOTORS** — Condensed catalog bulletin issued by Star Electric Motor Co. presents specifications and descriptions of standard motors and generators. Illustrations show typical applications in hoists, comminutors, diesel generators, printing equipment, machine tools and other equipment. Specifications and load

Continued on page 14

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FOUR PAGES OF "KNOW HOW"—10-12-14-16

DIAMONDS IN A

New and Improved Vitrified Bond

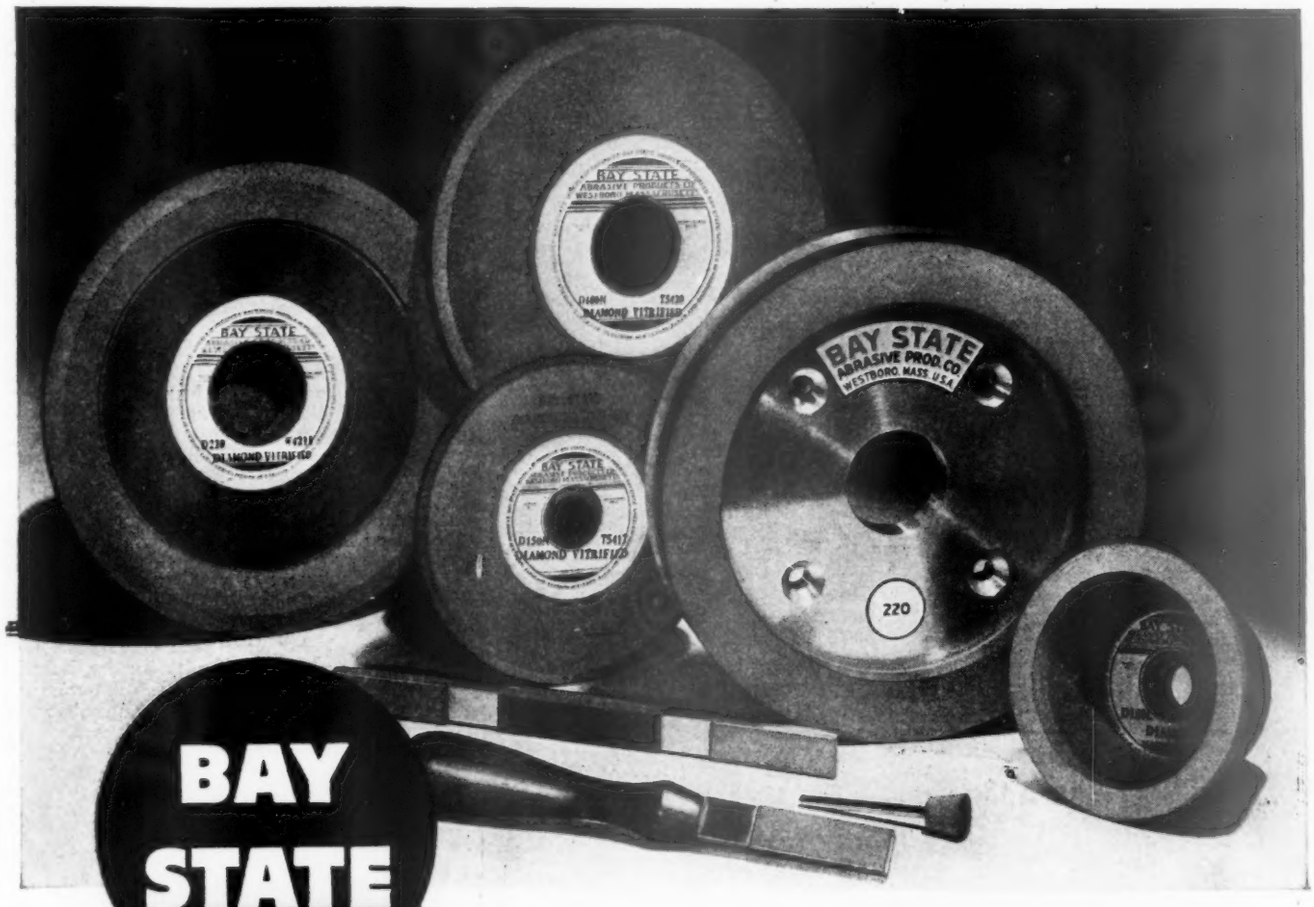
A new vitrified bond designed expressly for diamond abrasive makes a lusty new champion in the grinding of cemented carbide tools and other super-hard substances! The Bay State line of diamond abrasives (resinoid bonded, excellent for many precision and form-grinding operations; and metal bonded, best suited for off-hand grinding jobs) is now supplemented by a new *vitrified* bond.

Considerable research and experiment, together with thorough testing in actual use, have proved the superiority of this Bay State development. Now, the unparalleled abrasive power of diamonds gains the advantages of vitrified bonding — great strength and rigidity, plus faster, cooler cutting action. Results are long life, hair-fine accuracy and lower grinding cost per tool — important additions to the already high economy and efficiency of diamond abrasive grinding.

Typically, Bay State makes available to you this latest achievement, in a wide range of standard shapes and sizes . . . every one of them built to uphold Bay State's record of *top performance consistently duplicated.*

Write for Bulletin #1980, containing full information on Bay State Resinoid, Metal and Vitrified Bonded Diamond Abrasives.

BAY STATE ABRASIVE PRODUCTS CO.
27 Union Street, Westboro, Mass.



BAY STATE
ABRASIVE PRODUCTS
Top Performance Consistently Duplicated

GRINDING WHEELS · HONING AND SUPERFINISHING STONES · PORTABLE SNAGGING WHEELS
MOUNTED WHEELS AND POINTS · CUT-OFF WHEELS · INSERTED-NUT DISCS AND CYLINDERS

"Know-How" Information, Continued

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capacities are included for squirrel-cage induction motors ½ to 200 hp; wound-rotor induction motors ½ to 200 hp; direct current motors 1 to 200 hp.

☐ **34. FLUORESCENT BALLASTS** — Amer-Tran ballasts for fluorescent lighting are covered in price list issued by American Transformer Co.

☐ **35. SAFETY TOOLS**—"Safety Tools of Ampco Metal" just issued by Ampco Metal, Inc., discusses new line of safety tools made of Monel metal. This bulletin contains chemical composition and properties of the Monel tools, suggested applications and similar data. Tools are recommended for use in connection with acetylene, amatol, ammonia, gas, carbon tetrachloride, magnesium, natural gas, sodium nitrate, varnish, around hydrogen and oxygen, etc.

☐ **36. COLLETS**—Collets are subject of new booklet issued by the Sutton Tool Co., Sturgis, Mich. In addition to showing standard draw-in and push-out collets, the booklet also lists the new full-floating collet with interchangeable and replaceable jaw developed especially for handling hot rolled stock. Diamond serrated principle is discussed with explanation of how it makes for reduced spoilage and easier handling.

☐ **37. COOLANT FILTER** — Coolant-Klean filter designed to remove abrasive and metallic particles from grinder coolant is described in bulletin issued by Cuno Engineering Corp. It is a compact, replaceable-element type filter, applicable to unit machines or centralized system. May be applied to any type of grinder and is adaptable to almost any machine using a coolant or cutting oil.

☐ **38. SPOT CONVEYING**—Bulletin describes power-flex unit conveying system, which is described as being as flexible as a cord and as solid as gibraltar, and as a universal portable-all purpose, profit-producing unit conveying system. Manufacturer states system can be used anywhere. Island Equipment Corp.

☐ **39. VERTICAL TURBINE PUMPS** — Worthington vertical turbine pumps for drilled wells, open or enclosed sumps, tanks, reservoirs and streams, and varied uses in a number of industries, are described in Bulletin H-450-B33. Capacities range from 25 gpm to 12,000 gpm with some pumps designed for heads over 600 feet. Any type of driver may be used. Priming devices are not necessary. Worthington Pump & Machinery Corp.

☐ **40. ARC WELDING**—Improved Wilson "Bumblebee" alternating current transformer arc welding machines are described in 16-page booklet just released by Air Reduction. Among machines described are the 300 and 500 ampere standard and all-weather models, and the new 200 ampere Bumblebee designed to meet the needs for a small arc welder. Engineering data and complete specifications are supplied.

☐ **41. WIRE CLOTH, BASKETS, BELTS**—Cambridge wire cloth, industrial baskets, and woven wire conveyor belts are described in Bulletin No. 79. Cambridge Wire Cloth Co.

☐ **42. BLAST CLEANING**—New Wheelabrator swing table is described in Catalog 214 just released by American Foundry Equipment Co. New table extends airless blast cleaning to wide range of intricate or irregular shaped work formerly cleaned in air-blast rooms. Four sizes of machine are now available.

☐ **43. V-BELTING** — New catalog section on Open End V-Belting has just been released by B. F. Goodrich Co. The section tells of the advantages of Open End V-Belting where use of endless V-belts is not practical. Line shaft and other similar drives can be utilized by using this type of belting and fasteners.

☐ **44. SELF-LUBRICATING BEARINGS** — Morganite friction-minimized bearings, including metallic and nonmetallic content bearings, composite bearing and machined or molded shapes of special quality, self-lubricating materials, are described in bulletin released by Morganite Brush Co. Morganite is chemically inert, has high degree of heat resistance, low coefficient of expansion and low coefficient of friction. Various grades operate dependably in temperatures from sub-zero to 850° F.

☐ **45. HI-POWER GRINDER** — Circular describes Chicago Wheel & Manufacturing Company's triple duty Hi-Power Grinder. Speed 17,000 rpm; capacity 2½" wheels; size 10" overall including chuck; weight 3 pounds. Built for the toughest kind of grinding jobs.

☐ **46. CONTOUR SAW CHART** — This chart shows various kinds of material, the tooth to use for various sizes, and the speed to use for various sizes. Chart can also be used in straight sawing with hard edge flexible metal cutting band saw blades. Opposite side has chart showing information on skip tooth band saw blades. The Capewell Manufacturing Co.

☐ **47. DIAMOND WHEEL Care** — "Diamond Wheels—Their Care and Lubrication is subject of brochure available from the Stadoil Mfg. Co. Proper care and lubrication is important to wheel life.

☐ **48. RADIUS DRESSERS**—Six page catalog describes three models of radius dressers, including Model 150 that makes practical dressing the tangent to a radius and the radius too with one set-up, is available from U. S. Tool & Mfg. Co. With this one instrument the operator can dress (1) a radius, (2) an angle, (3) a compound-complex angle, and (4) an angle tangent to a radius, in one operation. Catalog #945, 60 pages, describes special high speed milling cutters.

☐ **49. CLEAR WATER**—Process of preparing clear water, the equivalent of commercially distilled, by ion exchange, is described in Bulletin 4181, "Cochrane Demineralizers" available from the Cochrane Corporation. This new method is said to offer opportunities of economies and improved products wherever there is a need for mineral-free water.

☐ **50. MACHINERY AND CONTACT Service**—New bulletin describing industrial machinery castings, mining machinery, marine winches, and specialized industrial products has been issued by Lake Shore Engineering Co. Products range from tourist camp stoves to 15-ton castings. Bulletin also outlines the company's facilities for manufacturing products on contract or building special equipment.

☐ **51. SWITCH GEAR**—Detailed information on metal-enclosed dead front switchgear for low voltage distribution circuits is contained in four-page bulletin (B6376) issued by the Allis-Chalmers Mfg. Co. Outdoor low voltage switchgear enclosed in a weather-proof housing is also discussed.

☐ **52. HEAVY DUTY CASTER**—Circular describes 1300 Series Super-Dreadnaught Caster for general industrial purposes, made by Faultless Caster Corp. Caster will roll and swivel easily under loads up to nine tons per caster.

☐ **53. VALVES**—Safety and Relief Valve selection is simplified by new catalog

Continued on page 16

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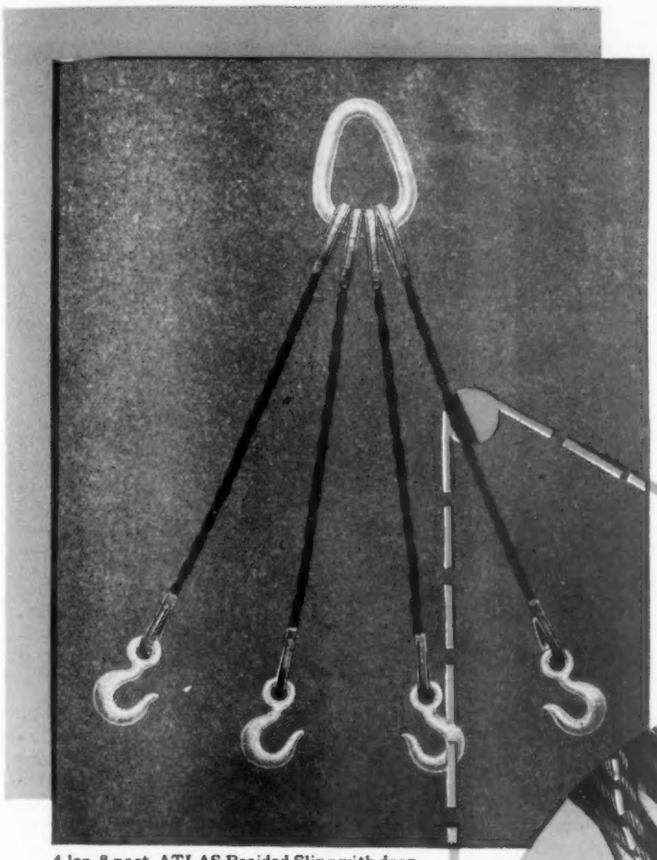

4-leg, 8-part, ATLAS Braided Sling with drop-forged hooks—just one of many sizes, types and assemblies custom-made for your safety.

Don't take chances with safety! Always specify

MACWHYTE *Atlas* *Braided* WIRE ROPE SLINGS!

These two ropes → are left lay, but in the sling they are braided to the right.
←These two ropes are right lay, but in the sling they are braided to the left.
This patented ATLAS construction makes possible an extremely flexible and kink-resistant sling that is exceptionally easy to handle. All ropes follow a continuous spiral path throughout the entire body length in such a way as to provide great reserve strength protection, and maximum safety.

Rigging up loads for connection to crane hooks is a hazardous business. Only slings with adequate safety factors are good enough for safe handling in your plant. For your safety, breaking strengths and safe loads at various angles of use are listed for each size of Macwhyte ATLAS Sling, and published in Macwhyte Sling Catalog S-7.

Send for Sling Information!

Ask for your copy of Macwhyte Sling Catalog S-7 and book of photographs "Safe Slings in Industry" 44-1. Mail request on your Company letterhead to Macwhyte Company or any of our distributors or mill depots near you.

MACWHYTE COMPANY

2918 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of the CORRECT wire rope for your equipment

Left & Right-Lay Braided Slings · Aircraft Tie-Rods
Aircraft Cable · "Safe-Lock" Swaged Terminals

Mill Depots: New York · Pittsburgh · Chicago · Ft. Worth · Portland Seattle · San Francisco · Distributors throughout the U.S.A.

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NO 44-1-S

RIGHT-LAY **MACWHYTE SLINGS FOR INDUSTRY** LEFT-LAY

"Lifting safety to new heights"

Macwhyte Wire Rope Slings are made to meet the capacity of any crane built

"Know-How" Information, Continued

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(No. 45) issued by Farris Engineering Co. Pictorial index chart shows line drawings of all the basic Farris valve types. With this chart a valve user can easily select type of valve he needs. Index shows what the valve can be used for and where to find its specifications in the catalog.

☐ **54. SEALEDPOWER MOTOR** — Four-page bulletin describes Crocker-Wheeler Sealedpower motor, which was developed for use in dusty locations, in places where there is excessive moisture, and for all applications where the conventional AC totally enclosed, fan-cooled motor has been used in the past. It is available in sizes from 2 hp to 15 hp. Crocker-Wheeler Electric.

☐ **55. ALUMINUM, Sheet, Strip**—Bulletin 22-A gives ordering data and detailed information on Reynolds sheet and strip aluminum. Data includes, sizes, alloys and tempers, dimensional tolerances, weights, government and commercial specifications, chemical composition, physical property specifications, and other data. Reynolds Metals Co.

☐ **56. FLOOR HARDENER**—Folder tells about Lapidolith Liquid patented chemical floor hardener which is said to add years of usefulness to concrete and terazzo floors. It is said to protect against acids, sales and alkalis, effects or alternate freezing and thawing, and mineral, vegetable and animal oils. L. Sonneborn Sons, Inc.

☐ **57. BATTERY CHARGERS** - Bulletin 203 describes Battery Chargers for materials handling systems, made by The Electric Products Co. Every battery charger is fully automatic. Single and multiple circuit chargers are described and illustrated; also, different types of motor-generators. Charging installation is illustrated.

☐ **58. TRACK JACKS**—Buda track jacks are described in four-page bulletin issued by The Buda Co. It gives detailed information on four most popular types.

☐ **59. ARC WELDING**—"New Horizons in Welding" is name of sound film which is available without cost for showing in your plant or before your association meeting, from the Harnischpfeger Corporation.

☐ **60. "METAL CUTTING"**—This is name of pocket size booklet available from Victor Saw Works on the selection, care and use of hand and power hack saw blades. Teeth and cutting speed tables for various metals, and causes and cures of common blade difficulties are among the subjects covered. Recommendations given in booklet apply to all hack saw blades regardless of manufacturers, except where text states otherwise.

☐ **61. ELECTRODES**—Ellpro cutting electrodes for underwater or surface cutting are described in bulletin issued by Ellwood Products Corp. Can be used with any portable welding set by simply adding tank of oxygen. Their underwater use results in speedy, safe cutting at depths up to 280 feet and more. Palmgren Arc Oxygen Kit for Underwater Cutting is also described.

☐ **62. CERIUM**—Bulletin and mimeograph give basic facts about cerium, its indicated applications in refining grain of aluminum castings, stainless steel and tool steels, as a catlaysis in industrial processes, and "Improving the Properties of Secondary Aluminum Alloys by the Addition of Cerium." Cerium Metals Corp.

☐ **63. CERAMICS For Electronics Industry**—Products for use in the radio and electrical industries, including ceramics, metallized ceramics, Kovar (alloy for sealing metal to glass) and Kovar-Glass Hermetic seals, are described in new bulletin issued by Stupakoff Ceramic & Manufacturing Co.

☐ **64. BELT VULCANIZERS**—Portable electric belt vulcanizers for splicing and repair of rubber belting, are covered by Catalog Section 2158 issued by the B. F. Goodrich Company. Vulcanizers are of rugged construction. Maker states they are light in weight and easily handled and operated.

☐ **65. FASTENERS**—Catalog 18 describes Products of The Progressive Manufacturing Co. Special heads, threads and finishes on any metal or alloy adapted to cold upset. Catalog contains various Purchasing and engineering helps.

☐ **66. TUBE OILERS**—Catalog No. 60 describes assortment of styles of tube oilers for hard-to-get-at places—clutches, motor bearings, etc. They are furnished only on special specifications. Gits Bros. Mfg. Co.

☐ **67. SPEED REDUCERS**—Catalog No. 70 (128 pages) describes Jones Herringbone speed reducers. You will find it helpful in accordance with A.G.M.A. recommended practices for all conditions of service. They are built in single, double and triple reduction types and in every standard ratio in ratings ranging from 1.25 hp to 440 hp. Reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings. W. A. Jones Foundry & Machine Co.

☐ **68. VALVES** — Booklet DH-1186 describes R-P & C bar stock valves. Line includes bronze, iron and steel gate, globe and check valves—socks and Lubrotite gate valves—cast steel fittings, D'Este Automatic Regulating valves. Reading-Pratt & Cady.

☐ **69. POSTAL SCALES** — Catalog describes Detecto scales for industrial and commercial uses. Post-O-Meter is of interest. Press the right zone key, and correct postage cost appears. This automatic computing scale eliminates postage and zoning errors. Detecto Scales Inc.

☐ **70. SMALL V-BELT FASTENER**—Folder V-12 describes Flex-V fastener for the smaller sizes of V-Belts. Fastener is made in two sizes for A and B section V-belts. It makes for quick replacement of V-Belts without dismantling shafting or machinery. Flexible Steel Lacing Co.

☐ **71. INFRA-RED PROCESSES**—Eight-page booklet tells about the Penetray infra-red process, and presents typical installations. This is a non-technical booklet. Penetray Corporation.

☐ **72. CARBIDE TOOL SETS**—Bulletin describes Armstrong-Armide carbide tool sets. They are standard, multi-purpose tools which maker states offer special advantages on machining operations involving long runs, high speed, cast iron, tough alloy steels, non-metallics, and on hardened parts need for annealing and re-hardening is obviated. Armstrong Bros. Tool Co.

☐ **73. GEAR & WHEEL PULLERS**—Catalog sheets describe Armstrong-Bray gear and wheel pullers, which are available in 34 types and sizes. Chaingrip Universal pullers are available in 3-ton and 12-ton capacities. Armstrong-Bray & Co.

☐ **74. DECALS**—Bulletin V-200 illustrates Palm Brothers Decals. Title is "Short Cut to Effective Display and Trade Name Advertising." Samples of decals are available for the asking. Palm Brothers Decalcomania Co.

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FOUR PAGES OF "KNOW HOW"—10-12-14-16

Four Divisions One Purpose

WHEN you see the N-S trade-mark on a product, it is your assurance of unvarying quality. For this trade-mark, regardless of which division of National-Standard it identifies, stands for one overall policy.

This policy stresses—first, the importance of completely understanding the customer's problems. Second, that the engineering experience and research facilities of each division be made fully available to solve specific problems. Third, to always continue development work that will result in still further improvements in customers' products and methods of manufacture.

The products listed at the right indicate the wide scope of services offered by the four divisions of National-Standard Company. Your letter to any one of these will bring quick, personalized service.

NATIONAL-STANDARD COMPANY
NILES, MICHIGAN

Wire Braids flat and tubular in Steel or other metal. Tapes and Specialized Wire Products for Tire Beads, Steam Hose Armor, Reinforcement for Oil Well Drilling Hose. Braided Covering for Flexible Tubing, Aircraft and Tank Radio Shielding. Stranded Wire for reinforcing Flat and V Belts. Braided Covering for Electrical Cables. Drawn wire in small sizes down to .002, of Steel, Aluminum, Brass, Monel, Nickel Silver, Stainless Steel, Phosphor Bronze and other Alloys.

THE ATHENIA STEEL COMPANY, DIVISION
CLIFTON, NEW JERSEY

Cold Rolled, High Carbon Flat Steels in widths of 1/16" to 6½", Thickness .0015 to .062 Custom-made Steels—.60 Carbon and higher. Entire range of Annealed, Hard Rolled, Black Tempered, Tempered and Polished or Tempered and Polished with Blue or Straw Colored finish, Best quality Small Flat Springs.

WORCESTER WIRE WORKS, DIVISION
WORCESTER, MASS.

High quality Wire in small diameter sizes, down to .006. Round, Low and High Carbon Steel. Annealed, Hard Drawn, Tempered, Bright, Liquor Finish, Tinned, Copper Coated, Cadmium Coated, Galvanized.

WAGNER LITHO MACHINERY CO., DIVISION
HOBOKEN, NEW JERSEY

Complete lines of automatic equipment—designed, manufactured and installed for can companies and others using sheets in the metal decorating trade. Individual units consist of Roller Coating Machines, Conveyor Type Ovens and Auxiliary Equipment for tandem operation with lithographing presses, etc.

SAYS THE MAN IN THE HELMET—

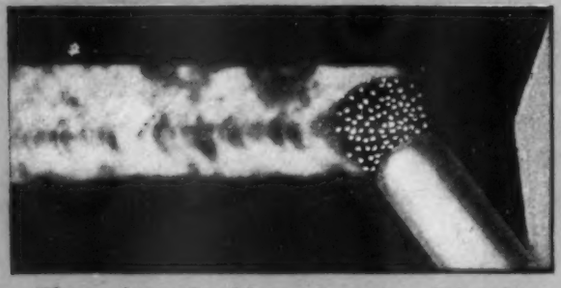
"Want an easy-working electrode? Then try this swell AIRCO No. 90...

(AWS Classification E-6013)

"A kid can do a grand all-position job with this A.C. and D.C. electrode."

"It's a cinch to use in all positions and it produces fine-looking, uniform beads. Penetration is good but not too deep. That's why it's great for welding thin steel sections.

"Slag does not crowd the arc when welding in a vertical position from top to bottom. It gives ample coverage, yet it comes off easily.



"The arc has a forceful, spraying action which makes vertical and overhead welds easier. You can use plenty of current — either A.C. or D.C. — and the electrode won't deteriorate at the stub end.

"FOR WELDING LIGHT-GAUGE STEELS use Airco No. 90-A. It's a honey for welding chrome-moly and similar aircraft steels and it's made in 1/16", 5/64", and 3/32" sizes."

Airco No. 90 and No. 90A conform to requirements of AWS Classification E6013. For full details on Airco's complete line of electrodes for every welding need — get in touch with your local Airco office and have them send you a free copy of Catalog No. 120. If you wish, address your request to the New York office, Dept. PR.

AIR REDUCTION

General Offices: 60 EAST 42nd STREET, NEW YORK 17, N. Y.
In Texas: MAGNOLIA AIRCO GAS PRODUCTS CO.
General Offices: HOUSTON 1, TEXAS
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Represented Internationally by Airco Export Corp.

Weld with

AIRCO **ELECTRODES** FOR BETTER WELDS AND EASIER WELDING

They MODERNIZED with

LINK-BELT Silverstreak SILENT CHAIN DRIVE

250 H.P. Silverstreak Silent Chain Drive, 2" pitch, 16" wide, 1972 ft. per minute speed. Top of casing removed to show chain. Note Link-Belt roller bearing and RC flexible coupling.

FOR HIGH SPEED--HIGH POWER--and HIGH EFFICIENCY

When a cotton oil mill in Tennessee decided to electrify and convert from steam-driven equipment, a thorough investigation was made of power transmission equipment and its performance in many other plants. Data thus obtained led to the selection of LINK-BELT Silverstreak Silent Chain Drives, because they deliver full power and maintain shaft speeds without slip and operate with negligible attention or upkeep over long periods of time.

The drive pictured above is one of the four major installations of Link-Belt Silverstreak Silent Chains in this mill, all noteworthy for their size, speed and horsepower transmitted. The chain shown is of 2 inch pitch, 16 inches wide and transmits 250 H.P. at nearly 2000 ft. per minute. Other drives in the mill operate at even higher lineal speeds.

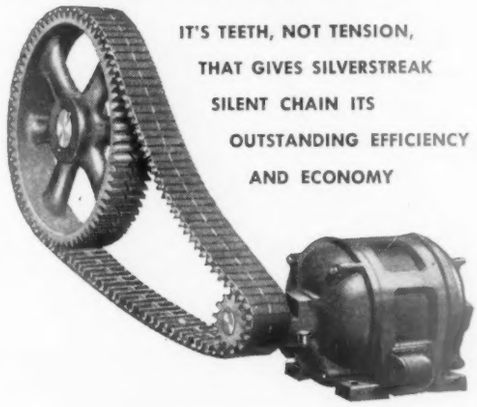
Engineers and plant executives facing the competitive conditions of peace-time operation will appreciate the old-fashioned advantages of low investment, low operating cost, high efficiency and long life found in Silverstreak Silent Chain Drives. Link-Belt power transmission specialists will gladly aid you in gaining these advantages for your plant.

LINK-BELT COMPANY 10,113

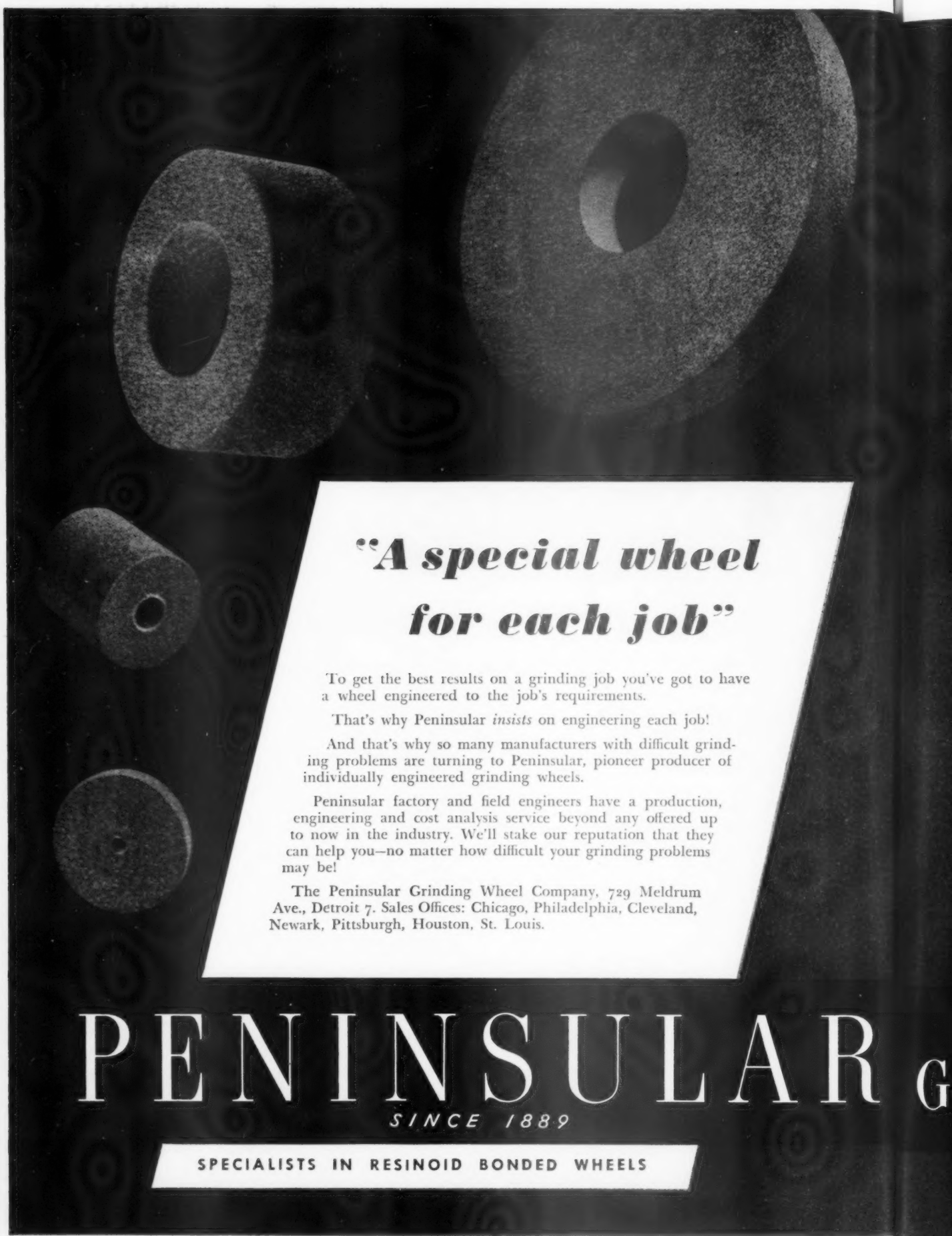
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities.

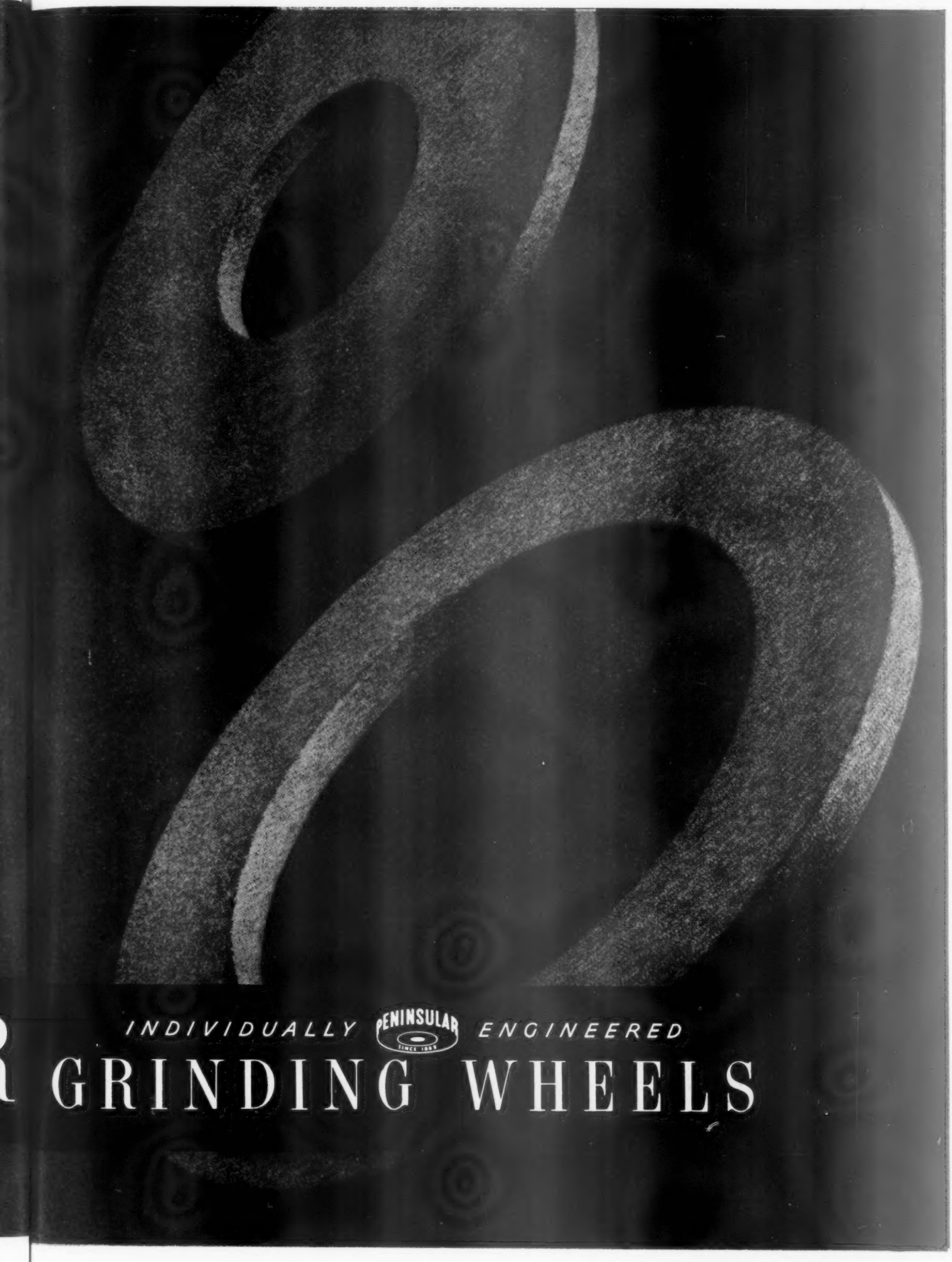
Silverstreak Silent Chain Drives range in size from 3/16" pitch to 2.5" pitch, and have been built in widths up to 48 inches. They run on short centers, stand up under shock loads and when properly encased and lubricated, are not affected by temperature variations or from periods of idleness. Their actual first cost is low, (often lower than other types of drives) and their yearly, overall service cost is always lowest. Many Link-Belt Silent Chain Drives are in operation today after 10, 20, 30 years of service, with practically no attention or upkeep. Send for Data Book 125, containing full engineering and application data. Write today!

Remember:



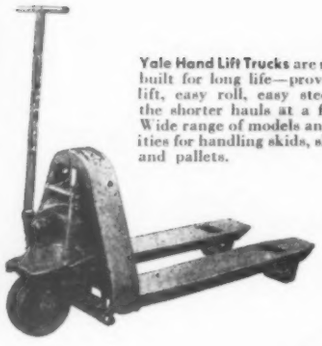
IT'S TEETH, NOT TENSION, THAT GIVES SILVERSTREAK SILENT CHAIN ITS OUTSTANDING EFFICIENCY AND ECONOMY


"A special wheel for each job"
To get the best results on a grinding job you've got to have a wheel engineered to the job's requirements.
That's why Peninsular *insists* on engineering each job!
And that's why so many manufacturers with difficult grinding problems are turning to Peninsular, pioneer producer of individually engineered grinding wheels.
Peninsular factory and field engineers have a production, engineering and cost analysis service beyond any offered up to now in the industry. We'll stake our reputation that they can help you—no matter how difficult your grinding problems may be!
The Peninsular Grinding Wheel Company, 729 Meldrum Ave., Detroit 7. Sales Offices: Chicago, Philadelphia, Cleveland, Newark, Pittsburgh, Houston, St. Louis.
PENINSULAR G
SINCE 1889
SPECIALISTS IN RESINOID BONDED WHEELS


INDIVIDUALLY PENINSULAR ENGINEERED
GRINDING WHEELS

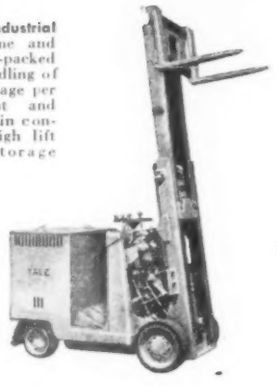
CUT "BACK-BREAK" and you CUT COSTS!

Yale Hoists—hand chain and electric models—are efficient time and labor savers that make light work of heavy lifting jobs—conserve worker energy, speed production and maintenance and cut handling costs.



Yale Hand Lift Trucks are ruggedly built for long life—provide easy lift, easy roll, easy steer—take the shorter hauls at a fast clip. Wide range of models and capacities for handling skids, skid bins, and pallets.

Kron Springless Dial Scales, made by Yale, eliminate excessive time- and money-wasting handling operations, provide accurate, efficient, low-cost weighing and counting of all kinds of materials. Available in all types from bench to crane scales.



Yale Electric Industrial Trucks save time and effort—are power-packed to speed the handling of tremendous tonnage per day—travel fast and maneuver easily in congested areas. High lift models save storage space.

Here's a job that *could* be a "back breaker", but with the Midget King Electric Hoist, mounted on a jib crane, this worker quickly and safely raises a heavy casting and swings it to his machine. A mere twist of his wrist on the one-hand, bar grip control operates the hoist; light pressure from his free hand guides the load. Such efficient handling is easy on muscles, gives the worker more time for productive jobs, speeds lifting and shifting, eliminates wasteful rehandling . . . *cuts costs.*

Engineered and built to exacting Yale standards, the powerful, high-speed, economical Midget King embodies maximum ruggedness, strength, and simplicity of design. Compact, light in weight, giving long-life, dependable service, it is the ideal electric hoist for loads up to 2 tons.

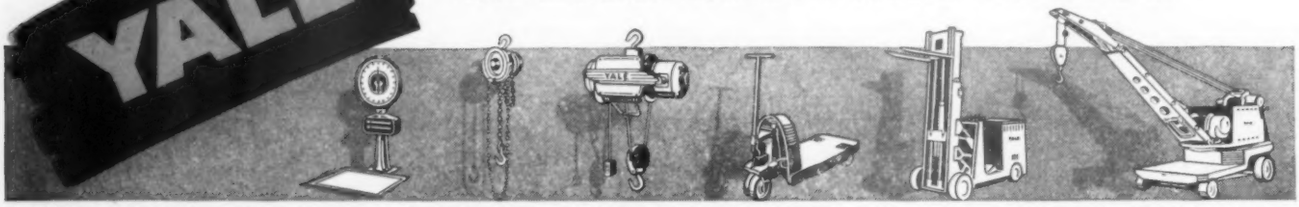
Why pay out "muscle money" to keep material on the move? It adds nothing to product value, only to production costs. Let Yale give you complete details about the Midget King and other time-saving, cost-cutting material handling machinery. A Yale representative is nearby. Phone or write today.

The Yale & Towne Manufacturing Company
4530 Tacony Street Philadelphia 24, Pa.

YALE

MATERIAL HANDLING MACHINERY

CUTS HANDLING COSTS . . . SAVES TIME . . . SAVES EFFORT . . . PROMOTES SAFETY



HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC • KRON INDUSTRIAL SCALES

"HERE'S THE TOOL FOR COST-CUTTING PERFORMANCE!"

In minimum spoilage, faster cutting and longer life between sharpenings, Morse Tools help cut production costs with the same efficiency they cut away metal.

MORSE THERE IS A DIFFERENCE

TWIST DRILL AND MACHINE COMPANY
NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. • CHICAGO STORE: 570 WEST RANDOLPH ST. • SAN FRANCISCO STORE: 1180 FOLSOM ST.

BECAUSE ITS BEAUTY IS MORE THAN SKIN DEEP...

Whenever anglers swap tales, they glory in their reels. A fine reel *is* an instrument of beauty, but a beauty that has to be more than skin deep if it is to successfully beat corrosion and wear.

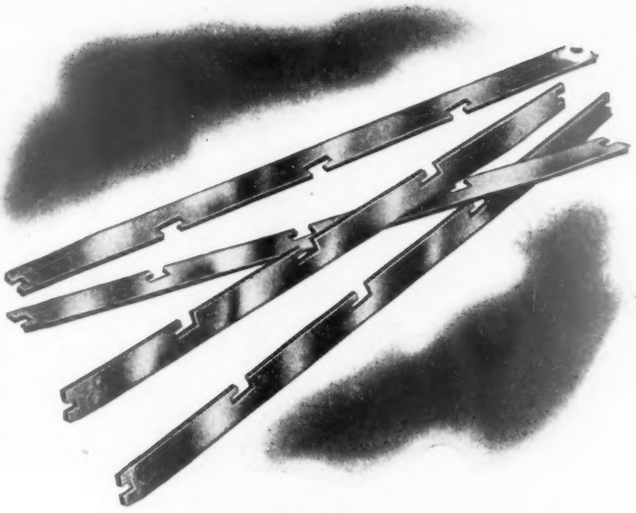
Among famous reels are those made by the Enterprise Manufacturing Company. Many parts of their Pfleuger reels are solid Riverside *Nickel Silver*. The Pfleuger Summit Reel is made almost entirely of Riverside *Nickel Silver*. Why? Because Riverside *Nickel Silver* resists corrosion *without plating*. Or if plated, and the plating wears, lustrous white Riverside *Nickel Silver* shows no ugly contrast.

Put Riverside *Nickel Silver*, *Phosphor Bronze* and *Beryllium Copper* to work for you. Let us send you interesting booklets about any or all of these 3 Riverside alloys.

INSIDE RIVERSIDE—*Our plant is just big enough to make people wonder how we can give them tests, analyses, and determinations so quickly. The answer is simple. We're just small enough that our laboratory men can hop out into the mill and pick up samples themselves. They do not have to fill out 57 forms or trust to messenaers.*

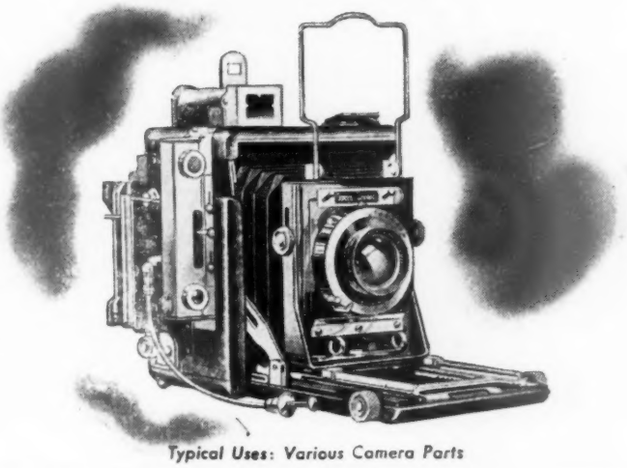
RIVERSIDE

RIVERSIDE PHOSPHOR BRONZE ALLOYS — Copper-tin alloys to which phosphorus is added. Made in variety of wrought and malleable alloys; special leaded mixtures; in non-malleable cast and turned rods for bearings and bushings. PROPERTIES—Wide range of tensile strengths and hardnesses. In general, phosphor bronze is a good electrical conductor, non-magnetic, and has a low coefficient of friction. It is easy to machine, can be welded by carbon or metal arc (there's a special alloy for flame welding), can be brazed or soldered. Easy to punch, draw, stamp, or spin. Phosphor bronze is rustless and resistant to corrosion, fatigue and wear. Supplied in sheets, strips, wire, rods, circles, bars, blanks or ingots.



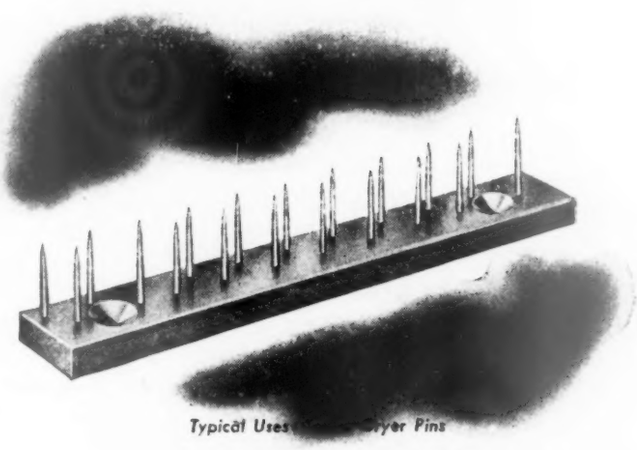
Typical Uses: Jordan Bars

RIVERSIDE NICKEL SILVER ALLOYS — A combination of copper, nickel and zinc in various proportions. Made in variety of alloys, tempers, anneals; and in free-cutting alloys. PROPERTIES—Vary according to alloys. Tensile strengths up to 160,000 p.s.i., elongations up to 50%. Nickel silver is valued electrically for its specific resistance, and physically because of its clear-through silvery white appearance. In general, it is tough, resistant to wear, fatigue, and corrosion. Easy to machine in any manner, weldable by *all* methods, can be brazed or soldered and is extremely workable. Readily formed, bent, drawn, stamped, punched, embossed or spun. Supplied in sheets, strips, wire, rods, circles, bars, blanks and ingots.



Typical Uses: Various Camera Parts

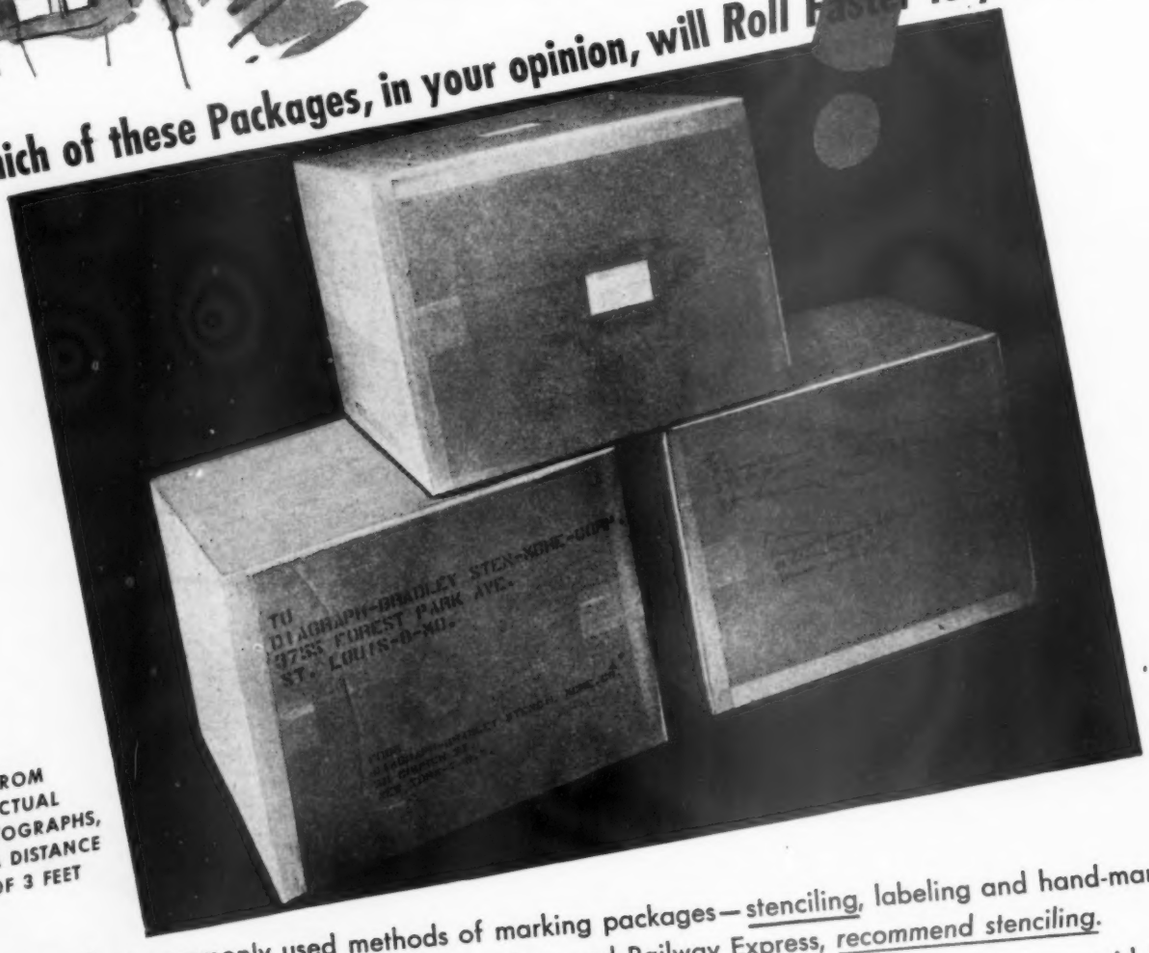
RIVERSIDE BERYLLIUM COPPER — an alloy with an unusual combination of properties — Unusually high strength. Excellent hardness, wear resistance and corrosion resistance. High thermal conductivity, good electrical conductivity. Easy to braze, solder, punch, draw or stamp. Can be cold worked. Outstanding for hot working qualities. Can be easily hot forged or hot pressed between 1050° and 1425°F., and heat hardened to achieve strengths rare to non-ferrous metals and alloys. Great resistance to fatigue under action, which is pronounced at high temperatures where other non-ferrous materials might fail. Negligible creep or hysterisis. Non-magnetic qualities. Supplied in sheets, strips, wire, rods, bars and blanks, usually, semi-hard, cold worked for fabrication and heat treatment.



Typical Uses: Dryer Pins

PHOSPHOR BRONZE
NICKEL SILVER
BERYLLIUM COPPER

Which of these Packages, in your opinion, will Roll Faster to your customer?



FROM ACTUAL PHOTOGRAPHS, AT A DISTANCE OF 3 FEET

These are three commonly used methods of marking packages—stenciling, labeling and hand-marking—common carriers, such as the railroads, truckers and Railway Express, recommend stenciling.

Why take a chance—rain and damp weather obliterate type or hand written labels—avoid hand addressed mistakes—illegibility—labels coming off—lost shipments—delayed shipments.

Stencil address your shipments to keep your packages out of the carriers' Lost Shipment Warehouse.

Stenciled Shipments Roll Faster

THE WORLD'S OLDEST AND LARGEST MANUFACTURER OF STENCIL CUTTING MACHINES

D.B. REG U S PAT OFF

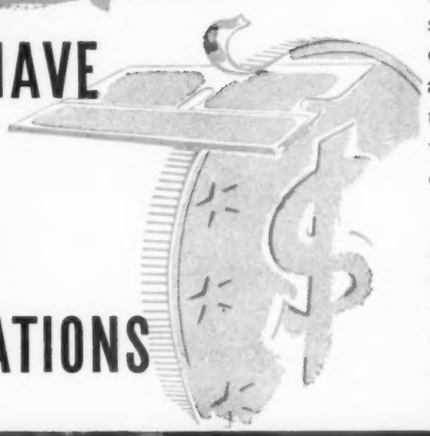
DIAGRAPH-BRADLEY
STENCIL MACHINE CORPORATION
ST. LOUIS 8, MISSOURI

DISTRIBUTORS IN PRINCIPAL CITIES—SEE CLASSIFIED SECTION—TELEPHONE DIRECTORY—STENCIL CUTTING MACHINES

OVER 100 D-B ITEMS FOR THE SHIPPING ROOM

Perhaps

YOU COULD SHAVE A LITTLE COST FROM A LOT OF OPERATIONS



ON EVERY JOB in the plant where a hand tool is used, there is often an opportunity to cut costs, improve workmanship, promote safety. *On any job* an obsolete or ill-adapted tool is a stubborn slow-downer, a day-after-day waster of time, skill, energy. In the average plant there are hundreds of operations where hand tools are directly affecting workers' efficiency. That is why a methodical, plant-wide replacement of misfit tools with ***the right Snap-on for each operation*** can contribute significantly to lower costs.

To manufacturing plants and service establishments, Snap-on's nation-wide tool service is conveniently available through 38 factory branch warehouses in principal industrial centers. Send coupon below for catalog of 3,000 modern Snap-on tools, and check if you wish a Snap-on representative to call.

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THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
8048-B 28th Avenue, Kenosha, Wisconsin

.....Send me the Snap-on catalog.

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Name.....

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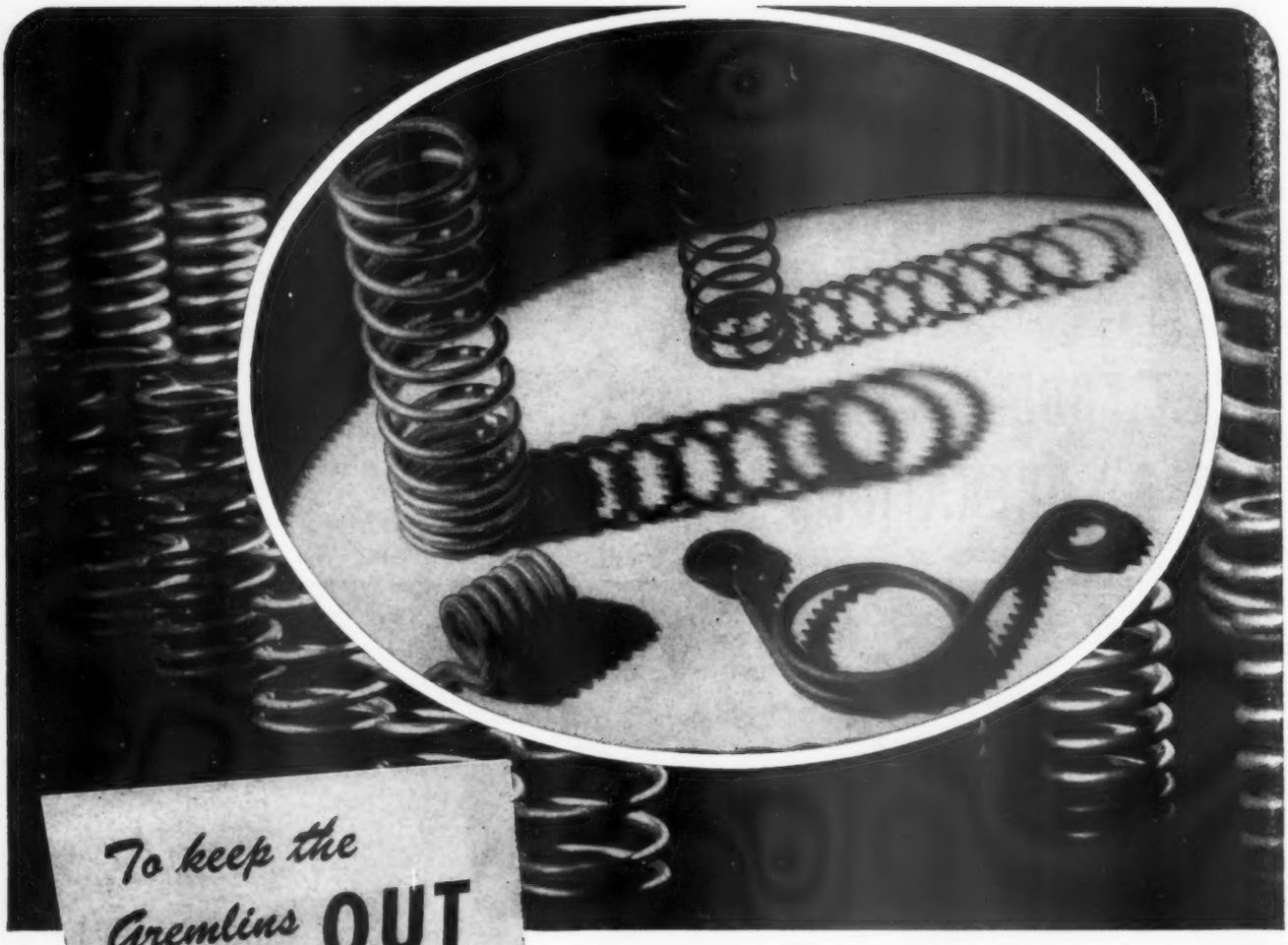
SNAP-ON TOOLS CORPORATION 8048-B. 28th Avenue KENOSHA, WISCONSIN



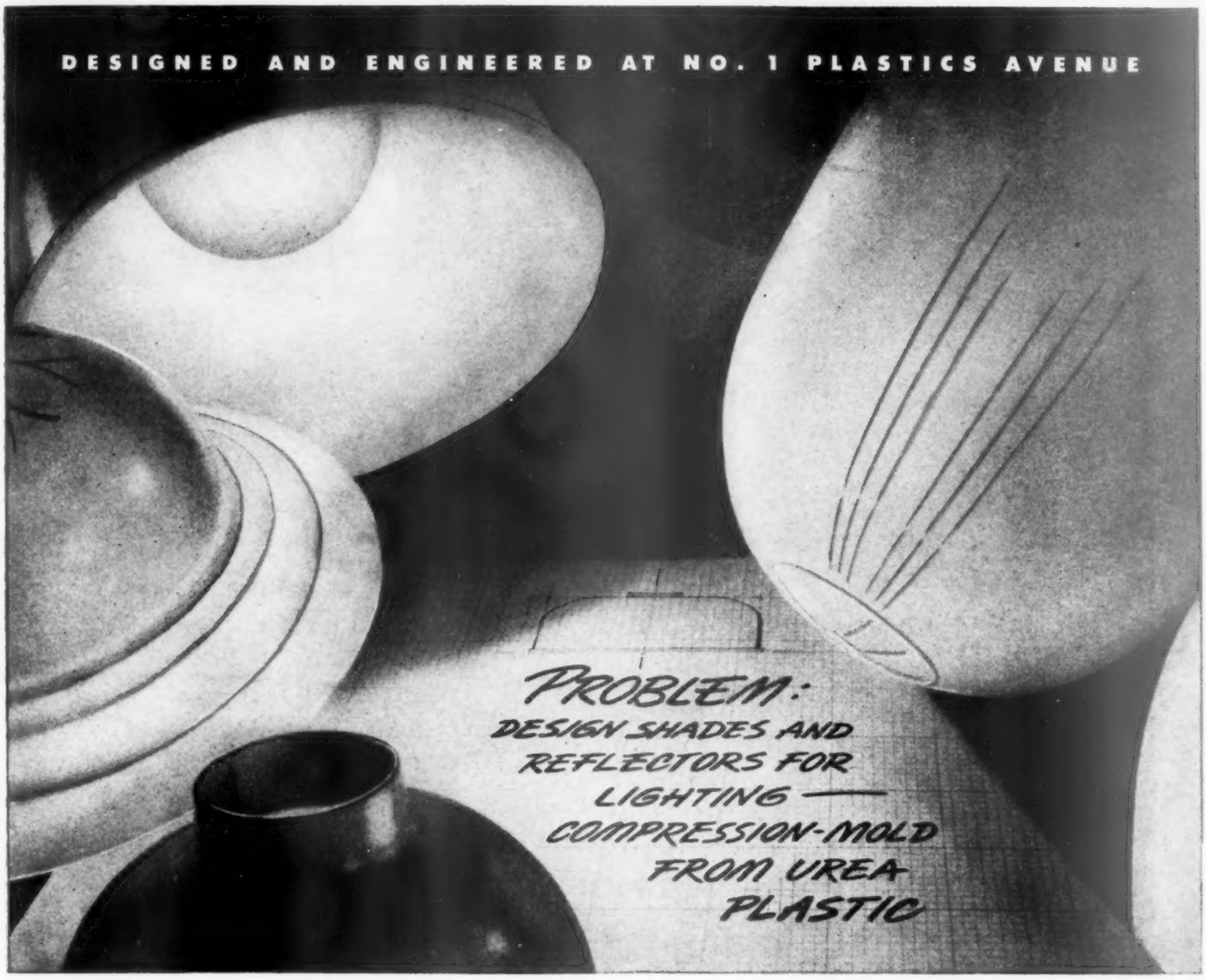
...let Cleveland Engineers *IN*

THE MINUTE the springs are installed, a flock of gremlins swoop down bent on mischief. Of course, we usually put the blame on eccentric loading, dynamic effects, or buckling, "surge," rubbing contact, twisting, and such things but it might as well be the gremlins, for no theoretical calculations or fixed formulae have ever been devised to cope with these problems. Here's where the cooperation of "Cleveland" engineers, who have spent a lifetime specializing in diagnosing and preventing spring troubles, is most valuable. This service is yours for the asking, without cost or obligation. Send us your blue prints and specifications, and tell us about operating conditions and what service life is expected.

Cleveland SPRINGS

CLEVELAND WIRE SPRING CO.

2012 West 25th Street, Cleveland 13, Ohio


DESIGNED AND ENGINEERED AT NO. 1 PLASTICS AVENUE
PROBLEM:
DESIGN SHADES AND REFLECTORS FOR LIGHTING —
COMPRESSION-MOLD FROM UREA PLASTIC

SHEDDING NEW LIGHT ON YOUR PLASTICS PROBLEMS

● Plastics now are giving a new lease of life to all kinds of lamps and fixtures . . . bringing them up to date.

Modern plastic reflectors and shades were designed at No. 1 Plastics Avenue . . . in standard interchangeable sizes . . . plain and decorated . . . and engineered to give a pleasing diffusion of light. These plastic lighting aids are compression-molded from a translucent urea material that won't shatter . . . that averages less than a quarter of the weight of glass. Such light weight and safety mean a lot in maintenance—getting all the light you pay for by frequent fixture cleaning.

This contribution to lighting is just one of many examples of the work of G.E.'s *complete* plastics service now available to all industry to solve problems of plastics applications to any kind of product.

Why not bring your plastics problem —no matter how large or small—to G.E.? And get a balanced and unbiased answer from the world's largest manufacturer of plastics parts. Write to Plastics Divisions, General Electric Co., 1 Plastics Avenue, Pittsfield, Mass.

EVERYTHING IN *Plastics*

G-E Complete Service — Everything in Plastics

Backed by 51 years of experience. We've been designing and manufacturing plastics products ever since 1894. G-E Research works continually to develop new materials, new processes, new applications.

No. 1 Plastics Avenue —complete plastics service—engineering, design and mold-making. Our own industrial designers and engineers, working together, create plastics parts that are both scientifically sound and good-looking. Our own toolrooms are manned by skilled craftsmen—average precision mold experience, 12 years.

All types of plastics. Facilities for compression, injection, transfer and cold molding . . . for both high and low pressure laminating . . . for fabricating. And G-E Quality Control—a byword in industry—means as many as 160 inspections and analyses for a single plastic part.

GENERAL ELECTRIC

CD46-A8

Continental

consult Continental for

Rolling Mills and Steel Plant Equipment

●

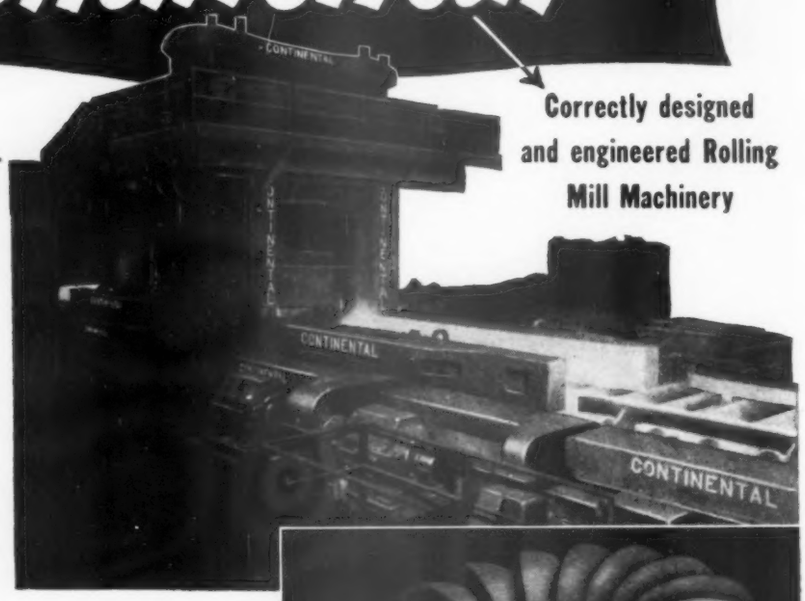
Carbon and Alloy Steel Castings for practically every application

●

Alloy Steel, Iron and Alloy Iron Chilled Rolls

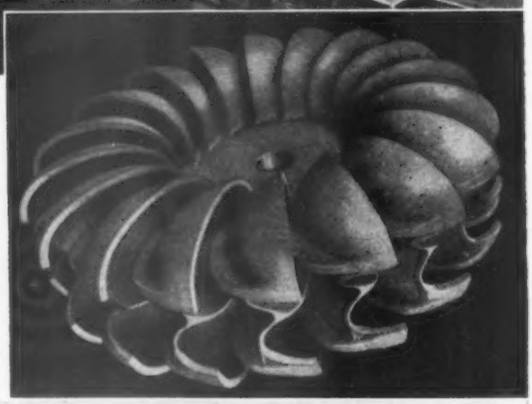
●

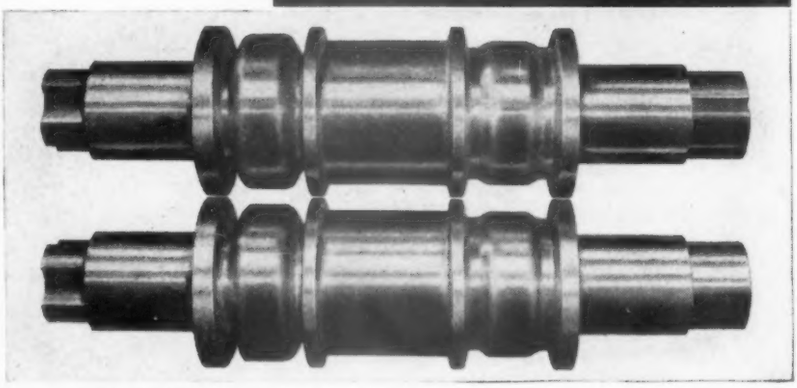
Special Machinery



Correctly designed and engineered Rolling Mill Machinery

Uniform, Precision-Made Castings





Rolling Mill Rolls for every purpose

Continental

FOUNDRY & MACHINE CO.

Pittsburgh • Chicago

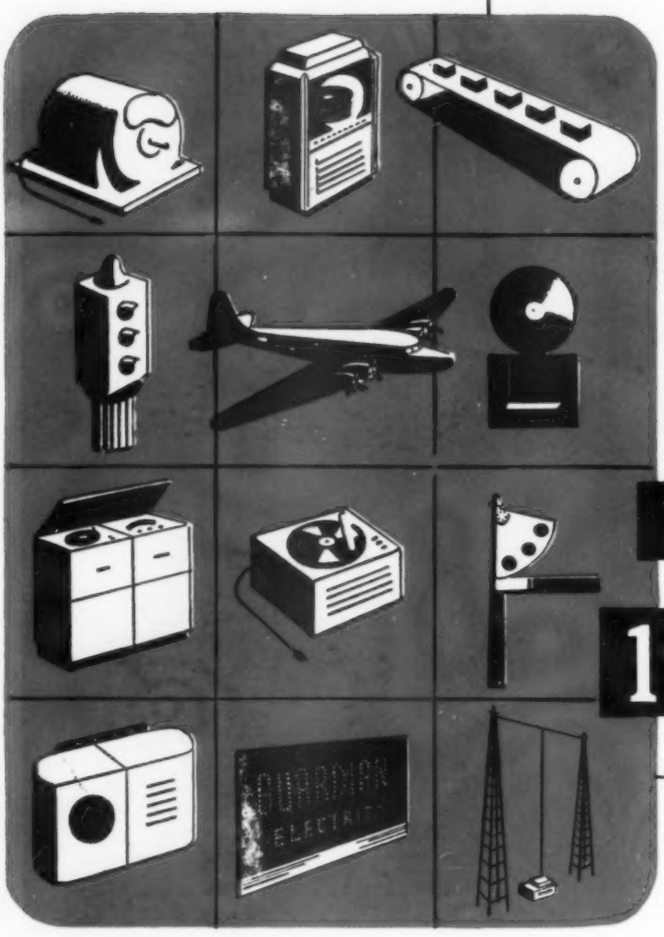
Are You Using Cut-off Wheels *that Really Fit Your Jobs?*

WHEN a Norton abrasive engineer tackles your cut-off jobs he's not limited to one special type of wheel. He has a *complete line* to choose from — over 50,000 possible specifications. For example, he has several varieties of resinoid bond, both natural and synthetic rubber bond, and shellac bond. He has Alundum, 57 Alundum and Crystolon abrasives. And in each abrasive and bond he has a wide range of grit sizes, grades (hardnesses) and structures.

You can be sure that a survey of your cut-off jobs by a Norton abrasive engineer will really cut costs for you — that among his 50,000 possible specifications there's the low cost wheel for each of your cut-off jobs.

NORTON COMPANY
WORCESTER 6, MASS.
Behr-Manning, Troy, N. Y. is a Norton Division

TOMORROW'S relays



1947

1946

for Designs of

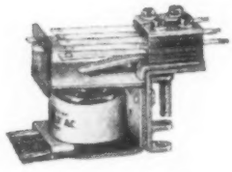
TODAY

Relays BY GUARDIAN

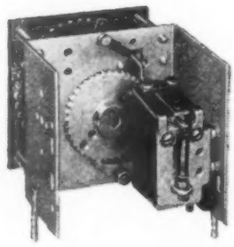
Electrical control in today's home radios and appliances—in home lighting—on the farm—in planes—on trains—for telephony—broadcasting—coin-automatic music and innumerable applications reveals a definite trend toward increased usage of *standard* Relays by Guardian. Such recognition of *standard* relays by forward thinking design engineers is the result of forward planning by Guardian to produce basic relays having a multiplicity of variations. Thus, where a "special" could have been specified Guardian invariably came through with a *standard* unit better qualified on

PERFORMANCE • PRICE • DELIVERY

For example, the Guardian Series 100 Relay is a *standard* type with replaceable coil and contacts. Operating range 3 v. to 230 v. at 60 cycles. Another unit, the Series R Stepping Relay is built for three basic types of A.C and D.C. operation: 1. Continuous rotation; 2. Electrical reset; 3. Add and subtract. Write on your business letterhead for NEW RELAY CATALOG showing many *basic* relay types, a complete line of solenoids, magnetic contactors, switch parts together with operating data, specifications, suggested applications. No cost. No obligation. Your catalog is waiting.



Series 100 A. C. Relay

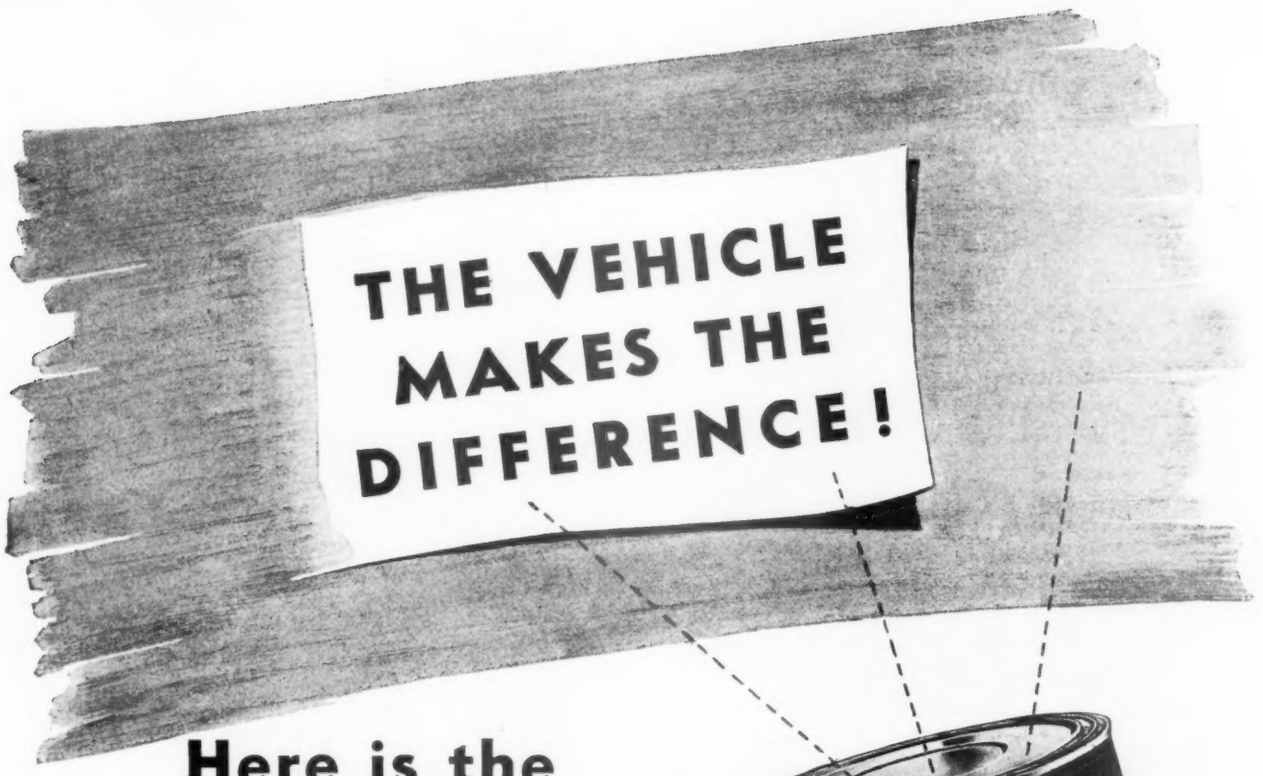


Series R Stepping Relay

GUARDIAN ELECTRIC

1635-B W. WALNUT STREET CHICAGO 12, ILLINOIS

A COMPLETE LINE OF RELAYS SERVING AMERICAN INDUSTRY



Here is the *ECONOMICAL PROTECTION* You Want!

THE RIGHT PAINT
***Immediately* READY TO USE**

OF course you get brighter surfaces, longer-lasting protection when you use aluminum paint. But, what about the **difference** in aluminum paints? – why does one fortify the surface longer and therefore reduce painting costs? It's the vehicle that makes the difference!

Permite Paints are made of an exclusive vehicle processed from synthetic resins and specially adapted oils and 99+% pure aluminum pigment . . . in America's only plant designed especially for aluminum paint making. Aluminum paint specialists in this plant possess the finest facilities . . . have the single objective of producing perfectly balanced and stabilized aluminum paints.

Permite ingredients are meticulously weighed, heated and timed through their processing. Pigment and vehicle are combined to assure the multiple leafing that more effectively armors against moisture, heat and cold, smoke and fumes. And Permite Paints are ready-mixed – ready to use whenever you open the can.

If it's economical protection you want . . . you want Permite Aluminum Paints – for any surface, indoors or out.

ALUMINUM INDUSTRIES, Inc., Cincinnati 25, Ohio ***Distributors in Principal Cities***

PERMITE *READY MIXED* ALUMINUM PAINTS

Eliminate VIBRATION NOISE FROM METAL DOORS AND PANELS . . .

with **WITCO #1085**

Vibration Dampener . . .

Here is a scientifically formulated compound that gives maximum sound deadening effect with minimum weight. A coating of only one half pound per square foot dampens at the rate of 12 to 14 decibels per second at ordinary driving temperatures (20° to 80°).

Witco #1085 meets all requirements for adhesion and freedom from slumping and provides a fungus-proof coating that protects against water, acid, and salt corrosion. It seals seams and cracks and air dries to handle in one hour—hard in four hours. Applied with standard mastic spray equipment and may be used over bare, slightly oily, primed or painted metal surfaces.

Write at once for samples and technical data on this new, superior sound deadening compound . . . also its companion product Witco #77 Metal Protector for use under fenders, pans and other under-car parts.

WITCO

WITCO CHEMICAL COMPANY

435 N. MICHIGAN AVE., CHICAGO 11, ILL. ★ ESTABLISHED 1920 ★ 7310 WOODWARD AVE., DETROIT 2, MICH.

STAINLESS STEEL PIPE FITTINGS

Right in Stock

Stainless fittings are just as easy to get as stainless pipe —from Frasse. In addition to a complete range of types 304, 316, 347 seamless and welded *pipe*, Frasse keeps a fat stock of stainless *fittings* handy, too.

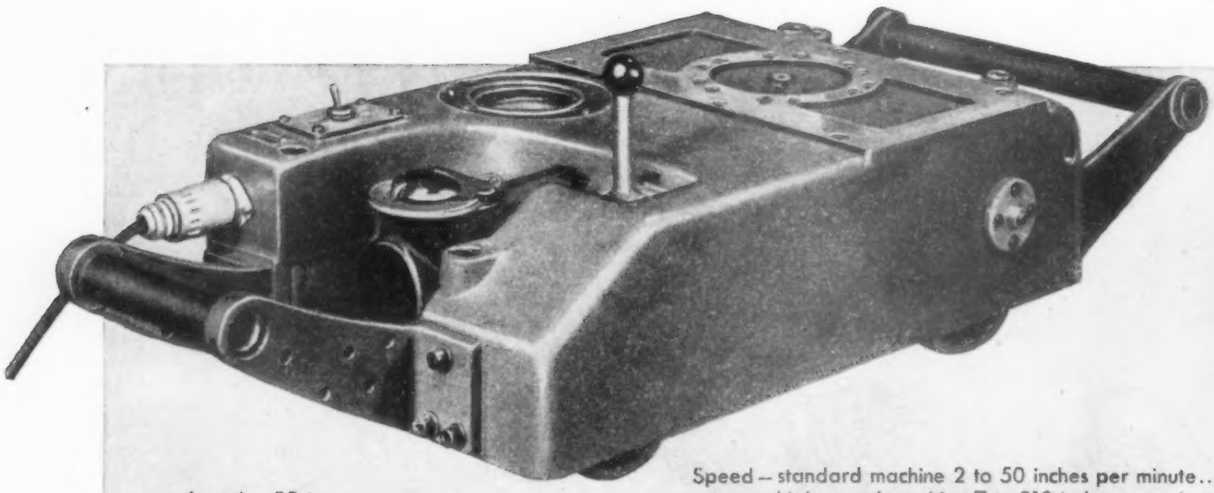
Elbows, tees, couplings, nipples, bushings, unions and similar screwed fittings can be furnished from Frasse warehouse *at once*. Stock standard is type 304, 150 pounds W.P. . . . other analyses and special fittings can be shipped on short notice. Valves, too, are quickly available in standard gate and globe, type 304.

Whatever you build of stainless, you'll find Frasse a quick source—not only for bars, sheet, tubes and pipe, but accessories as well. It's easy . . . more convenient . . . to get *all* your stainless from Frasse. *Call Peter A. Frasse and Co., Inc. 17 Grand St., New York 13, N.Y.(Walker 5-2200) 3911 Wissahickon Ave., Philadelphia 29, Pa. (Radcliff 7100) 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) Jersey City • Hartford • Rochester • Syracuse • Baltimore*

FRASSE

STAINLESS STEELS AND TUBING

BARS	SHEETS	PLATES	STRIP
Types	Types	Type	Type
302, 303 316, 347	302, 304 316, 347	304	302
ANGLES	**TUBING**	**PIPE**	**WIRE**
Type	Types	Types	Type
304	304, 316	304, 316 347	302



Length 32 in.
Width 12½ in.
Height 9 in.

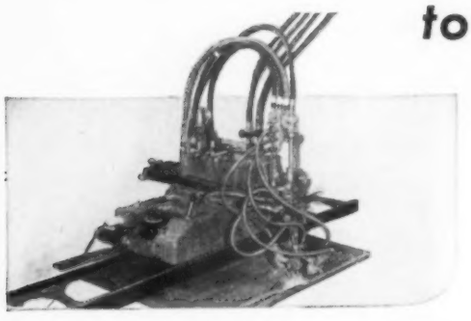
Speed – standard machine 2 to 50 inches per minute... high speed machine 7 to 210 inches per minute. Equipped with direct, continuous reading speedometer... inherently accurate.

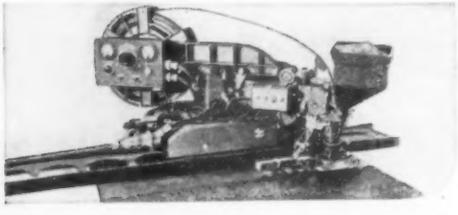
Heavy Load Capacity – 500 lb.

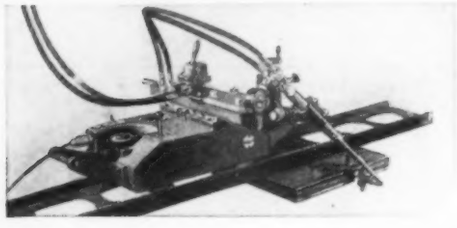
Adaptability – Runs on special track, I-beams, or any flat surface.

An Electric "PACK MULE"

to mechanize these processes







CUTTING

Straight Line Cutting
Bevel-Cutting
Heavy Duty Cutting
Plate-Edge Preparation

WELDING

UNIONMELT Automatic Electric Welding
HELIARC Welding
Mechanized Oxy-Acetylene Welding

HEAT TREATING

Flame-Hardening
Flame-Softening
Flame-Strengthening
Stress-Relieving

Ask Linde for more information

The words "Unionmelt," and "Heliarc" are trade-marks of Union Carbide and Carbon Corporation or its Units.

THE NEW CM-37 MACHINE CARRIAGE

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

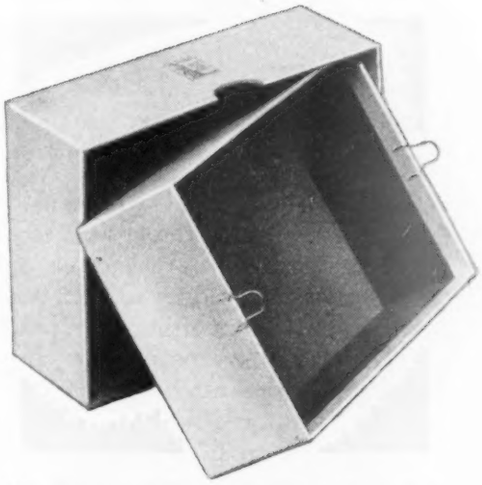
In Canada: Dominion Oxygen Company, Limited, Toronto

From pens to penicillin Mason boxes help to move and to sell the world's goods. Mason's packaging engineers are backed by over fifty years of experienced box making — your assurance of a perfectly packaged product.

FILLING THE DEMAND

One of the world's most famous pen manufacturers needed thousands of broken lot deliveries when their new pen was recently introduced. They needed a quick, dependable shipping container with added safety, too. Naturally, they chose the Mason MailMaster — same box they had depended on to ship the pens to the boys overseas.

If one of your problems is economical packaging and quicker shipping, investigate Mason MailMaster for maximum protection, economical shipping. It's the box with the patented wire closures. Write today for catalog showing the entire line of Mason MailMasters, Dept. 14 The Mason Box Company, Attleboro Falls, Massachusetts.



The patented Mason "MailMaster". Light and unbelievably strong, with positive wire closure.

The MASON BOX COMPANY

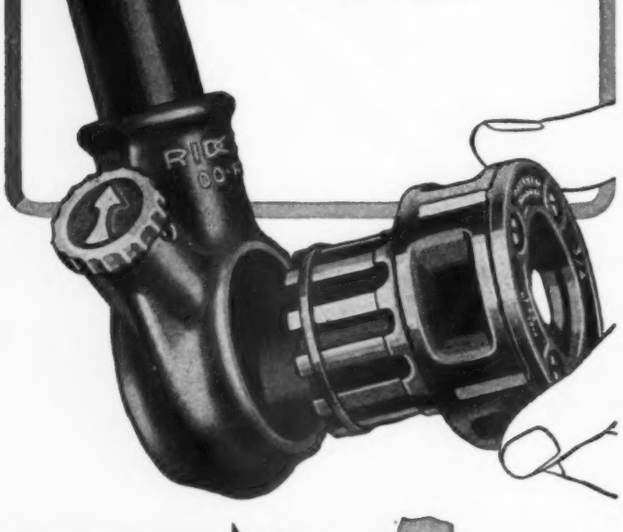
MANUFACTURERS OF AMERICA'S NUMBER ONE BOX . . . THE MASON MAILMASTER

You can cut clean threads quickly... with this rugged, handy, small

RIDGID

RATCHET THREADER

No. 00R & 111R



Handy carrier for any combination of sizes

● Quick and easy does it with this tough little steel-and-malleable ratchet die stock — heat-treated toolsteel dies, precision cut and factory tested, give you smooth perfect threads. Die heads snap in from either side, can't fall out. No special dies are needed for close-to-wall threads. External ratchet No. 00R for ⅛" to 1" pipe, No. 111R for ⅛" to 1¼" — internal ratchet No. 0R for ⅛" to 1," No. 11R for ⅛" to 1¼." For durable efficient work-saver threaders... ask your Supply House for RIDGIDS.

You do it faster, more easily, with this guaranteed

RIDGID

HEAVY-DUTY PIPE WRENCH

UNCONDITIONAL GUARANTEE
If this Housing ever Breaks or Distorts we will replace it Free
THE RIDGE TOOL CO.
ELYRIA, O.

This means no more wrench housing repair expense!

● Pick up a RIDGID by the powerful comfort-grip I-beam handle and it *feels* like an unusually efficient wrench. It *is*. The precision-cut alloy jaws grip pipe firmly, let go instantly. Adjusting nut spins easily in all sizes, won't bind. You like the handy pipe scale on the full-floating hookjaw, the replaceable heeljaw. And the guaranteed housing assures you long expense-free service — most for your money. Ask your Supply House.

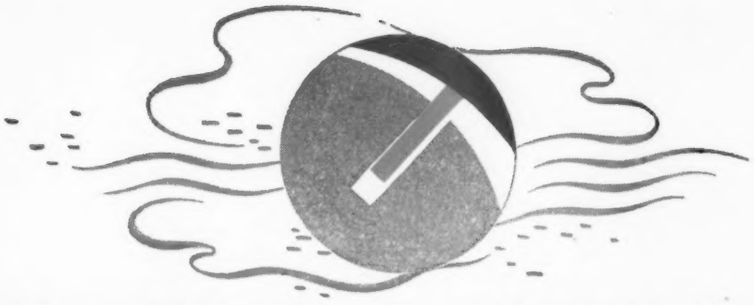
RIDGID *Strap Wrench.*

Millions of RIDGID Tools in use

★ RIDGID ★

WORK-SAVER PIPE TOOLS

The Ridge Tool Company
Elyria, Ohio, U. S. A.



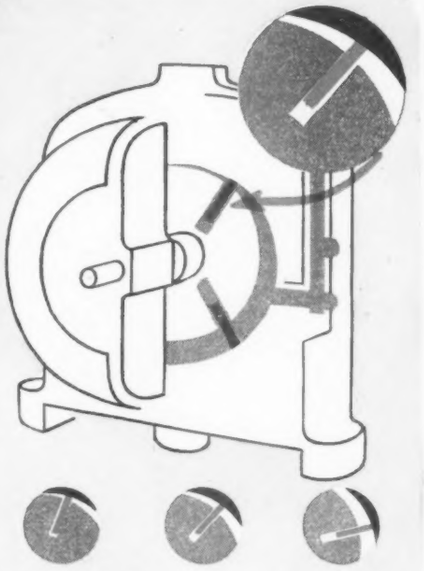
UTTER SIMPLICITY, MASTERFULLY DEVELOPED

. . . the Gast Vacuum Pumps (to 28 in.), Compressors (to 30 lbs.), and Air Motors (to 1 h.p.)

Gast design shows what can be done by working *WITH* principles instead of settling one design problem by creating two new ones. And Gast manufacturing exemplifies the old truism about doing one thing well.

The result is a line of rightly-priced, service-free vacuum pumps, compressors and air motors of the kind manufacturers appreciate having as original equipment on their machines, and users like to find there.

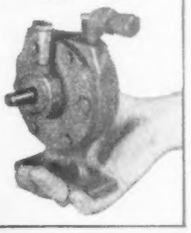
If you do not use air power but *COULD*, to better advantage, or if you already use air power, Gast, surely, will prove to be your better selection from both the original cost and the performance-and-maintenance standpoints, as it has for increasing scores of makers of a wide variety of machines and equipment. Avail yourself of Gast application experience, have Gast simplicity and faithful performance working for you ever after! GAST MANUFACTURING CORPORATION. 150 Hinkley St., Benton Harbor, Mich.



Vanes: Self-seating . . self-adjusting . . springless. Centrifugal force holds them against cylinder wall. They "work without works". . . Continuous, non-pulsating flow. . . More air per pound of weight, more air per horsepower. . . Forced-air cooling: long life, oil economy, no hot-oil odor . . . Automatic shaft seal: no packing, no leaking, no adjusting.

ENGINEERING TEST OFFER —So You Can SEE IF YOU'RE MISSING SOMETHING!

Simply write our Engineering Department and explain the operation you think air might handle, or describe the job air is already doing for you. Our Engineering Department will study your problem, select or design a Gast unit to do the specified work at less cost or at greater efficiency or both. Then, **without cost** or obligation, the recommended unit will be shipped to you for your performance tests.



GET THIS IDEA-CATALOG

It not only tells how Gasts are built and all about them, but suggests uses that may not have occured to you. Write for it; no charge or obligation!

GAST ROTARY

VACUUM PUMPS · AIR COMPRESSORS · AIR MOTORS

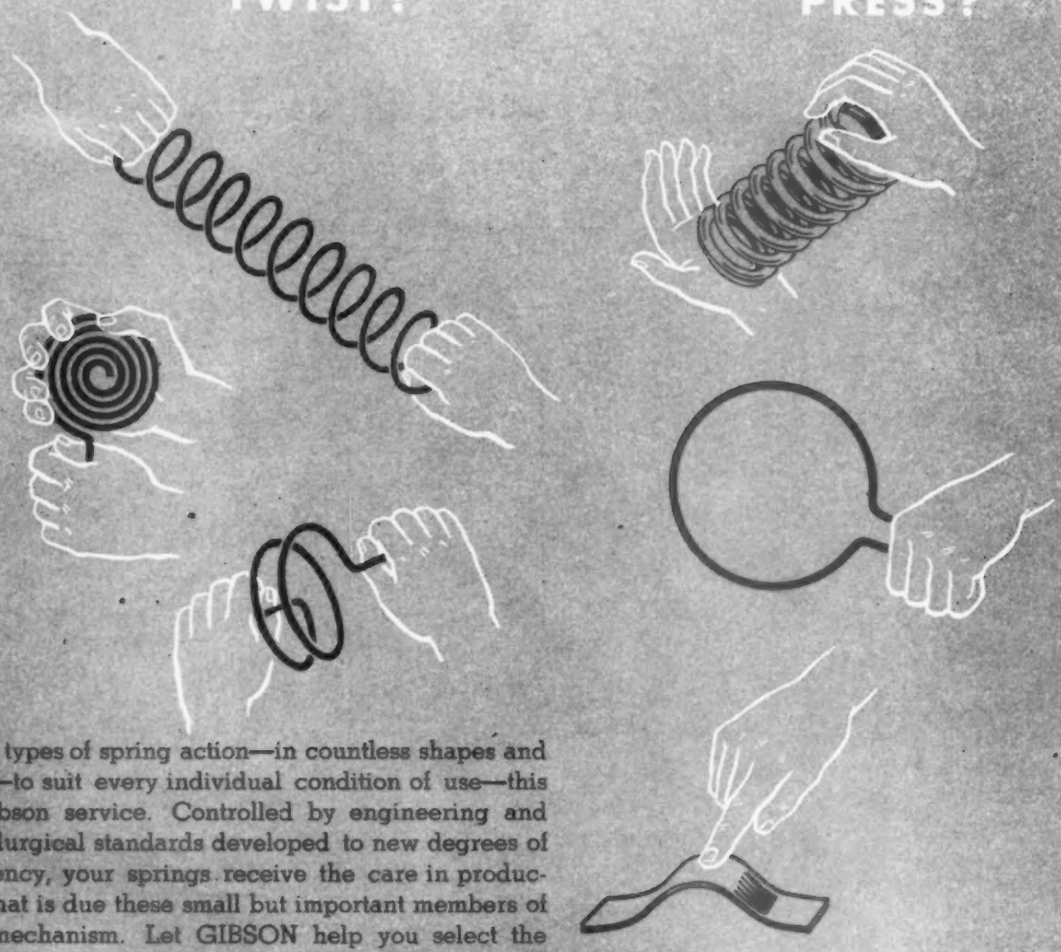
Supplying Air to Industrial Oil Burner

Vacuum Service on a Labeling Machine

1413

PULL...
WIND...
TWIST?

PUSH...
GRIP...
PRESS?



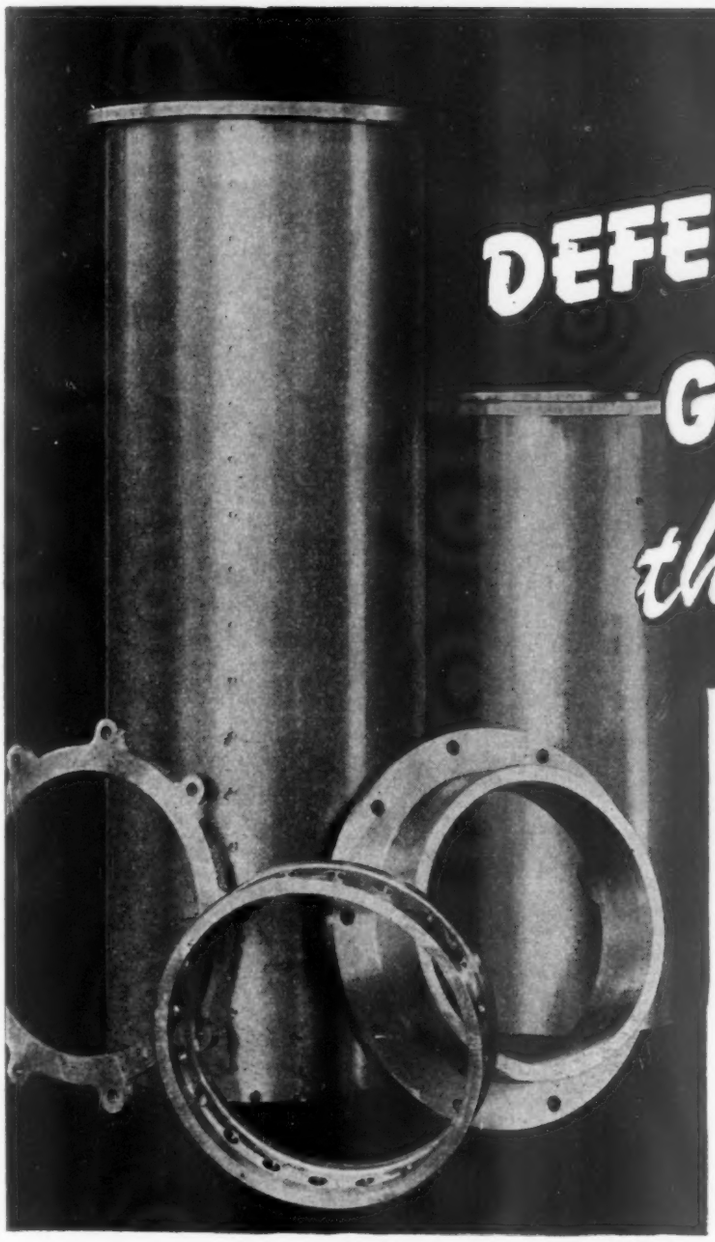
Basic types of spring action—in countless shapes and sizes—to suit every individual condition of use—this is Gibson service. Controlled by engineering and metallurgical standards developed to new degrees of efficiency, your springs receive the care in production that is due these small but important members of any mechanism. Let GIBSON help you select the *right type* of spring action, in the form *best suited* to your purpose.

IT PAYS TO USE

GIBSON-SPRINGS

Designed FOR YOUR PURPOSE

The WILLIAM D. GIBSON CO., CHICAGO 14, ILLINOIS
DIVISION OF ASSOCIATED SPRING CORPORATION



DEFECTS DON'T GET UNDER *their* SKIN!

These bronze parts, a stern tube bushing assembly, typical of thousands of precision tubular parts produced for the Government's war needs, as well as for the textile industry, were cast centrifugally and then finished in Shenango-Penn's own modern machine shops.

Free bulletin 143 is yours for the asking.

IN finishing large rolls and other important precision parts for engines, machinery or drives, it's costly business to spend man and machine hours only to turn up hidden defects in metallic structure. And, often enough, it's even more costly when such defects *stay* hidden until trouble develops in service.

The best way to lessen such risks, to lower your ultimate cost, is to specify Shenango-Penn centrifugal castings for all tubular or circular parts. You'll find them free from porosity, blowholes, sand inclusions or other structural weaknesses. They have greater density and higher tensile strength than other castings of the same analysis.

Shenango-Penn will supply rough castings or, if you prefer, deliver finished parts expertly machined to close tolerances in our own modern, completely equipped machine shops. In either case you gain lower production costs and a more dependable, more durable product.

Write for bulletin 143 which gives complete information about Shenango-Penn centrifugal castings, including chemical and physical analyses and specifications of various alloys available.

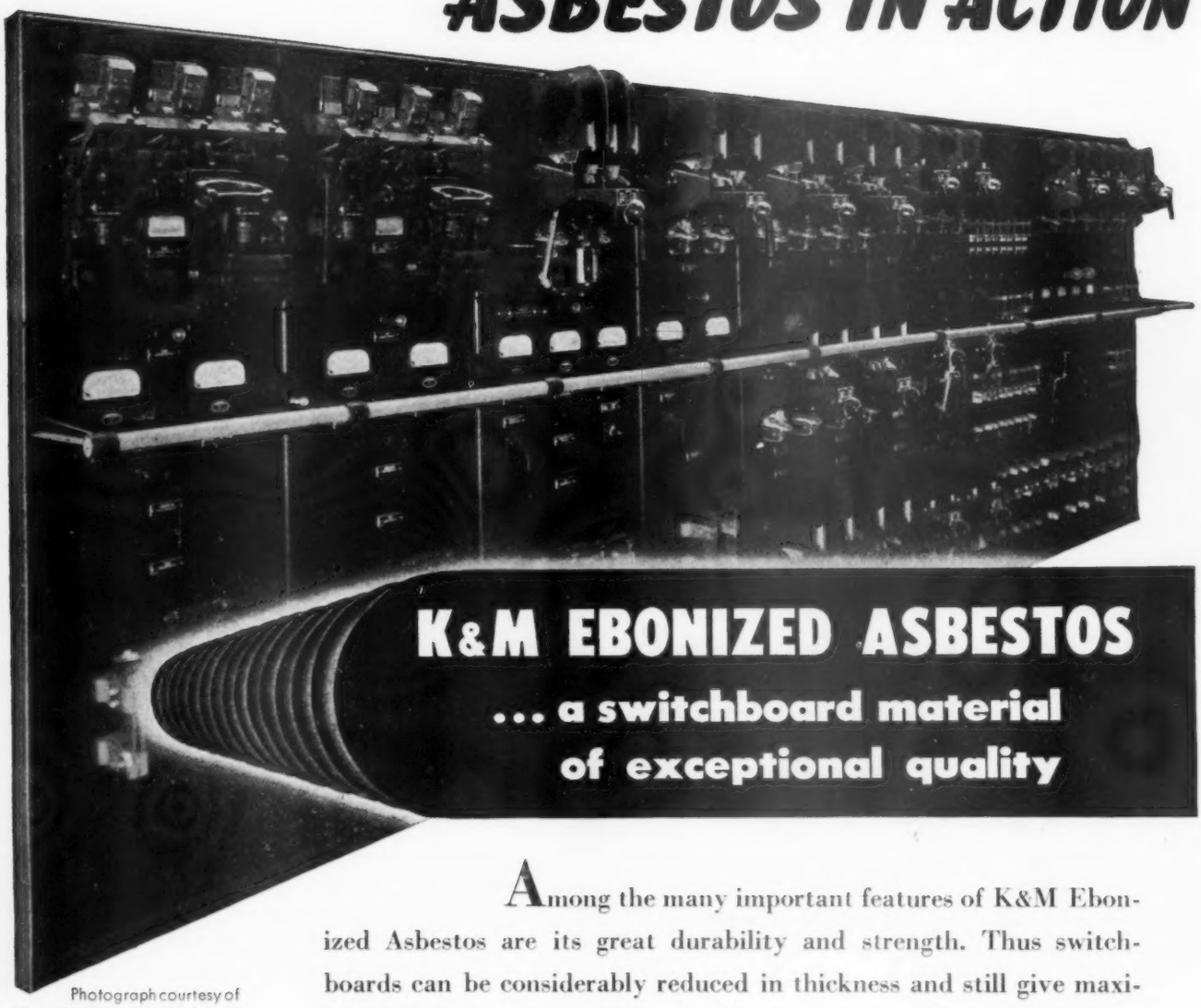
SHENANGO-PENN MOLD COMPANY
2459 WEST THIRD STREET • DOVER, OHIO
Executive Offices: Pittsburgh, Pa.

SHENANGO-PENN

ARMY NAVY

ALL BRONZES • MONEL METAL • ALLOY IRONS

ASBESTOS IN ACTION



K&M EBONIZED ASBESTOS
... a switchboard material of exceptional quality

Photograph courtesy of Wm. Wurdack Electric Manufacturing Co., St. Louis, Mo.

Among the many important features of K&M Ebonized Asbestos are its great durability and strength. Thus switchboards can be considerably reduced in thickness and still give maximum efficiency. Other features, listed below, are equally impressive.

K&M Ebonized Asbestos is made of a combination of asbestos fibre, binding cement and insulating compound, molded under terrific pressure into strong, monolithic sheets. Comes in standard or special "panel" finish . . . from ⅛" to 4" thick.

EFFICIENT FOR BUS BAR RUNS, TESTING TABLES, CABINETS, BENCH BOARDS, COMPARTMENT LININGS AND MANY OTHER TYPES OF ELECTRICAL INSTALLATIONS

•

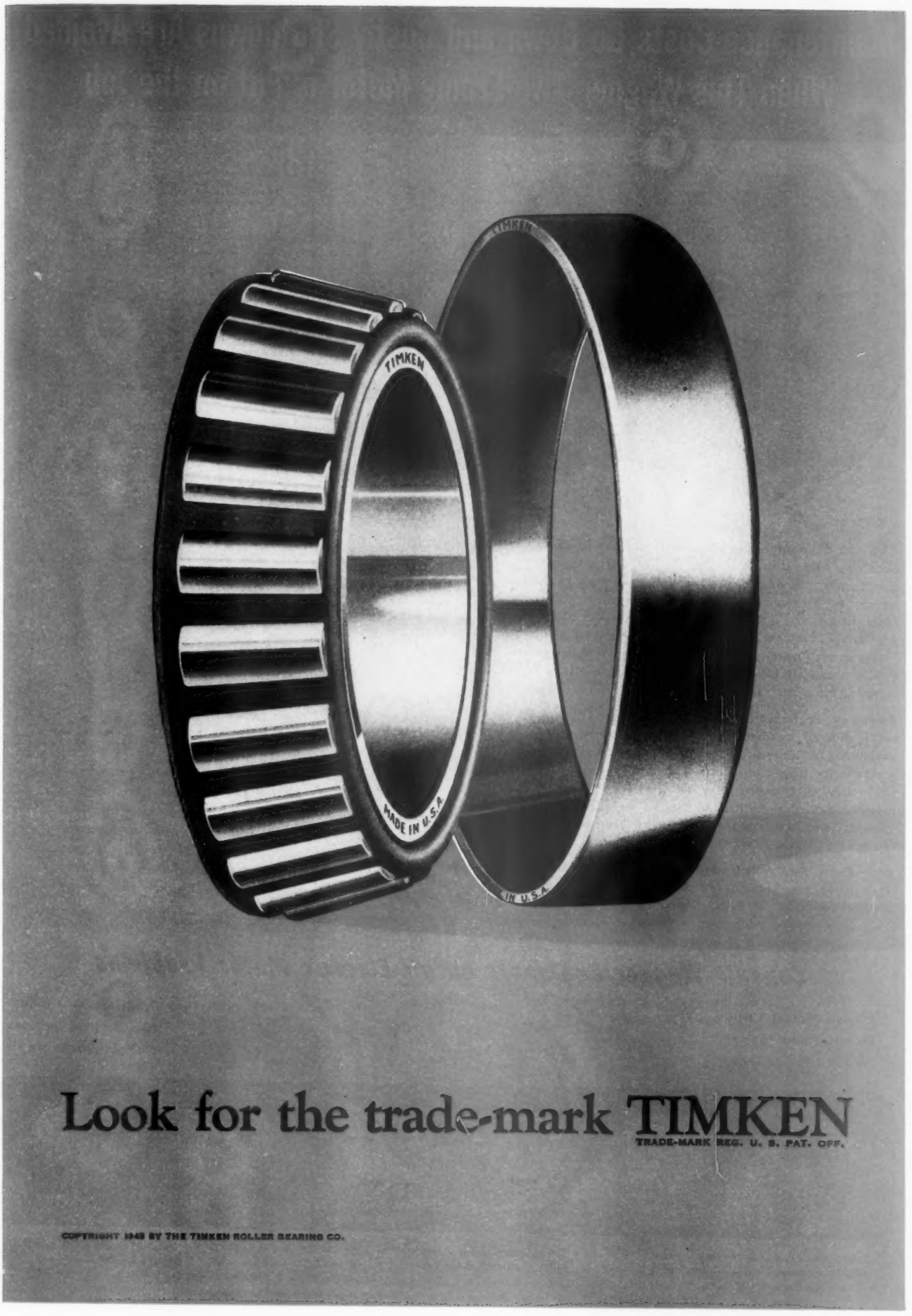
K&M Ebonized Asbestos is specially developed to meet the technical requirements of Underwriters Laboratories, Inc. when built into an assembled unit.

K&M EBONIZED ASBESTOS FEATURES:

- Exceptionally high dielectric strength
- Uniform density throughout
- Withstands severe shock, vibration and wide temperature variations
- Resists oil and water action
- Does not shrink, crack or bulge

Nature made Asbestos . . . Keasbey & Mattison has been making it serve mankind since 1873.

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

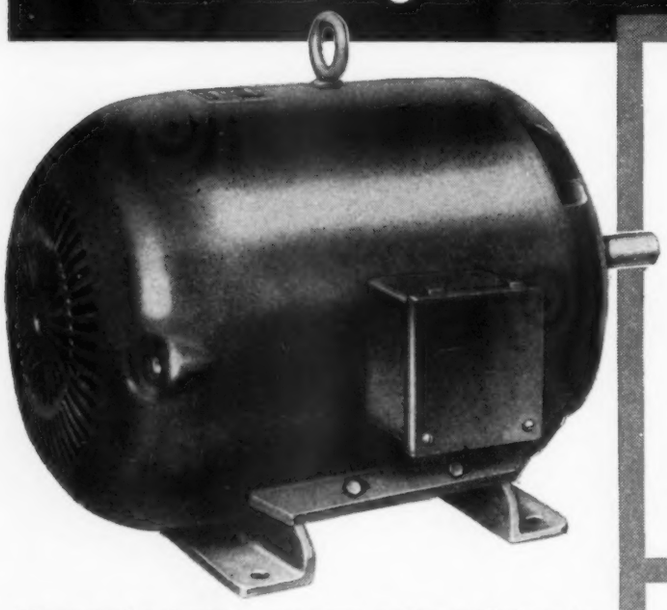


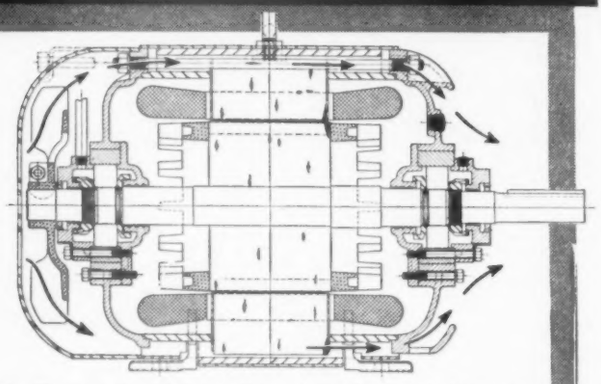
Look for the trade-mark TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

COPYRIGHT 1945 BY THE TIMKEN ROLLER BEARING CO.

Maintenance Costs Go Down and Costly Shutdowns Are Avoided When This Wagner Two-Frame Motor is Put on the Job



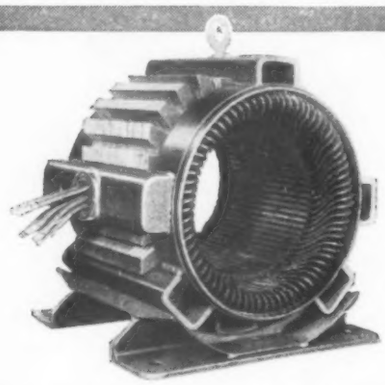


The Wagner type CP totally-enclosed fan-cooled motor has two frames: an outer frame that guides a strong cooling draft over the motor, and an inner frame completely sealed against the entrance of dust, fumes, or moisture into the vital parts of the motor.

The cost of maintaining open-type motors is likely to be excessive when dust, fumes, or moisture are present. Abrasive, conductive, or explosive dust, corrosive gases or fumes, steam and moisture are destructive to motors and cause frequent motor shutdowns for cleaning and repairing. The way to avoid excessive motor maintenance and production losses during motor shutdowns is to use Wagner type CP totally-enclosed fan-cooled motors which are fully protected against such destructive agencies.

As the upper diagram shows, Wagner type CP motors are self-protected against the entrance of dust, fumes, and moisture, and therefore give uninterrupted service despite severe operating conditions. Experience has proved time after time that motor protection costs less than motor maintenance, that maintenance costs go down, production goes up, and motor worries end when you standardize on Wagner CP motors throughout your plant.

Wagner type CP motors are available in several electrical types, and are but one of a widely diversified line of Wagner motors, all fully described in Bulletin MU-185 free upon request addressed to Wagner Electric Corporation, 6360 Plymouth Avenue, St. Louis 14, Mo.



The heart of the Wagner CP motor is this rugged, all-steel stator, rigidly constructed to meet the exacting needs of modern high-speed production. In larger sizes, the outer surface is deeply grooved (as here shown) to provide ample cooling surface for cool operation. The winding is completely taped well into the slots and all phase coils are insulated from each other by varnished-muslin phase-sheets.

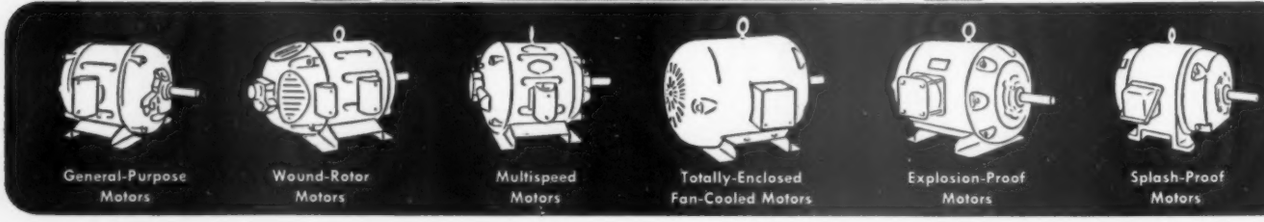
M46-3

Consult Wagner Engineers on all Electric Motor Problems

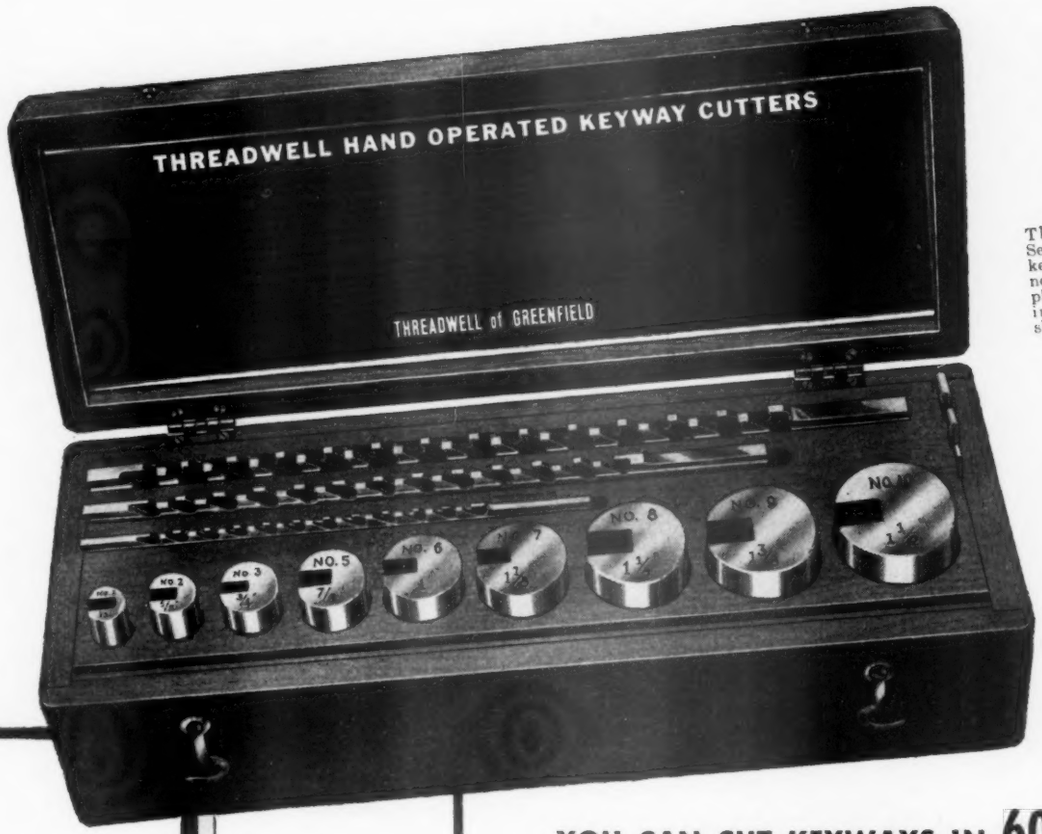
Electric Motors • Air Brakes • Brake Lining Hydraulic Brakes

Wagner

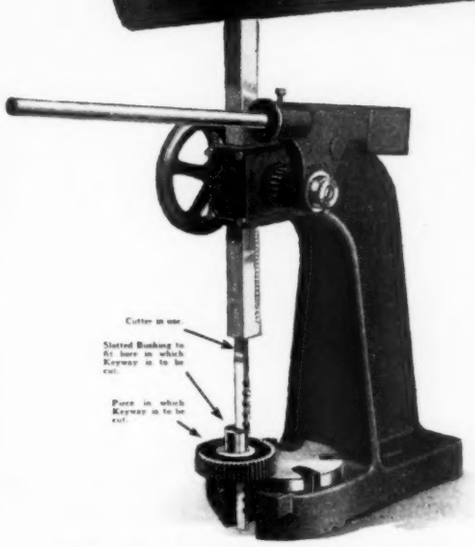
Transformers • Industrial Braking Systems NoRoL • Tachograph



Sales and Service Branches: ATLANTA 3 • BALTIMORE 18 • BOSTON 15 • BUFFALO 8 • CHICAGO 16 • CINCINNATI 10 • CLEVELAND 15 • DALLAS 1 • DENVER 2 • DETROIT 2 HOUSTON 2 • INDIANAPOLIS 4 • KANSAS CITY 8 • LOS ANGELES 15 • MEMPHIS 3 • MILWAUKEE 2 • MINNEAPOLIS 4 • NEW YORK 7 • OMAHA 2 • PHILADELPHIA 8 • PITTSBURGH 13 • PORTLAND 9 • ST. LOUIS 3 • SALT LAKE CITY 1 • SAN FRANCISCO 3 • SEATTLE 4 • SYRACUSE 2 • TULSA 3 • WASHINGTON 5 • *In Canada:* WAGNER ELECTRIC AT LEASIDE, ONTARIO—*Wagner motor parts are available at 350 Wagner-owned and -contract repair shops.*



Threadwell Keyway Sets take care of every keyway you're likely to need. They come complete with slotted bushings, broaches, and shims.



The Threadwell Arbor Press is just the ticket for use with Threadwell Keyway Cutters. Takes work up to 14" dia., 15" stroke. Hand leverage 48 to 1. Threadwell quality through and through. Ask for it at your Threadwell distributor's.

YOU CAN CUT KEYWAYS IN 60 SECONDS WITH *Threadwell* KEYWAY CUTTERS

There's nothing to it when you have this handy Threadwell Keyway Cutter Set. All you do is drop in the bushing that fits the bore, put the broach in the bushing's slot and press it through, once with the cutter alone, and again with shim to give you the depth you want. One minute and it's all done!

Keyways in gears, collars, pulley hubs, couplings, milling cutters, or what have you, are cut to standard width and any desired depth. Any number of keyways can be cut in a single bore and accurately indexed.

Here's one of the greatest little time and money savers in the shop. Anyone who has even an occasional keyway to cut will find that this Threadwell Keyway Cutter Set will pay for itself in short order. It's made to the same standards of quality and precision as *Threadwell Taps of Distinction*.

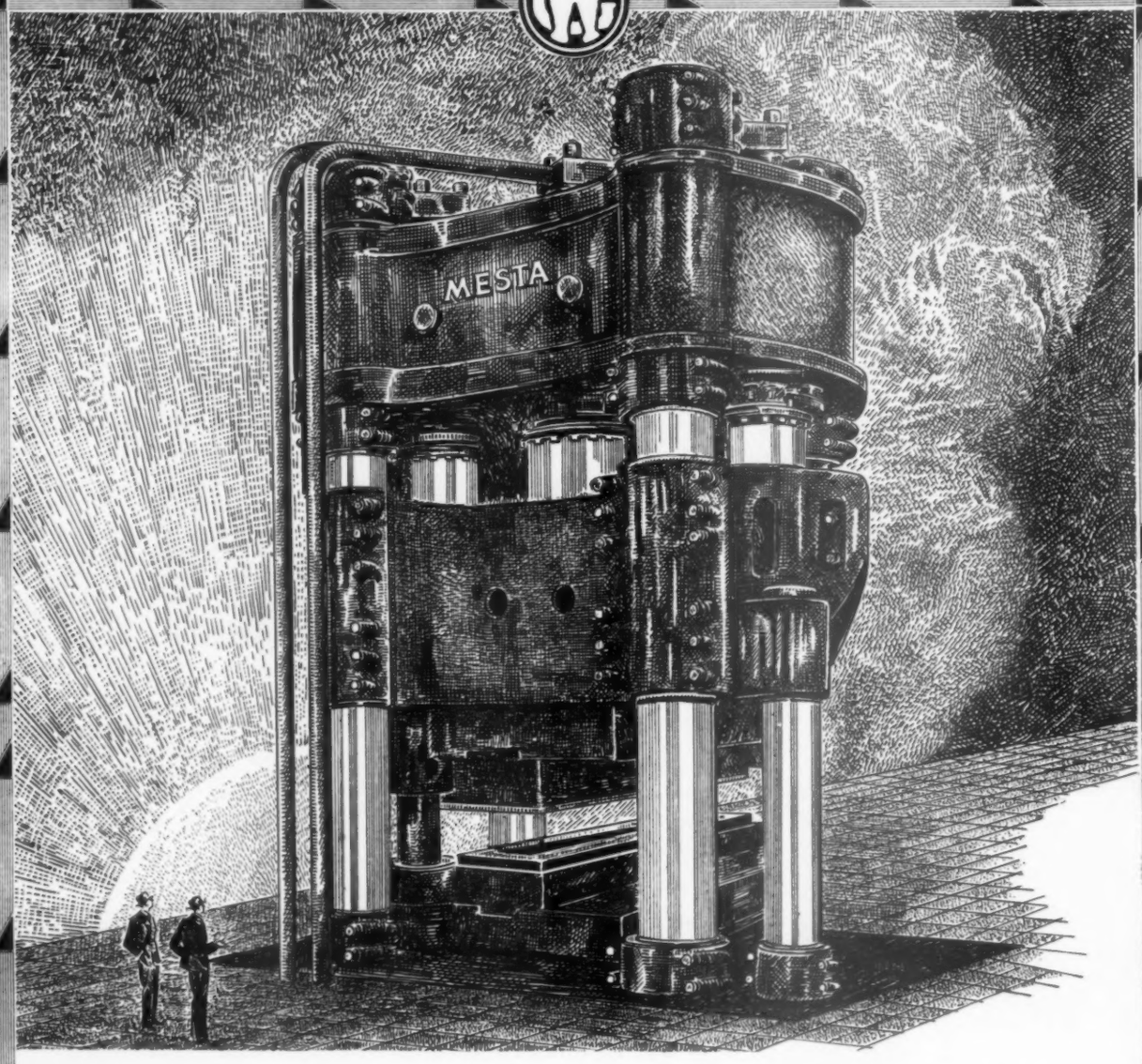
Ask your local Threadwell distributor to give you the whole story on Threadwell Keyway Cutter Sets and Threadwell Arbor Presses.

DISTRIBUTORS IN LEADING INDUSTRIAL CENTERS THROUGHOUT AMERICA

Threadwell
SINCE 1902
"TAPS OF DISTINCTION"

THREADWELL TAP AND DIE COMPANY • GREENFIELD, MASSACHUSETTS, U. S. A.

CALIFORNIA OFFICE, THREADWELL TAP & DIE CO. OF CALIF., 1322 SANTA FE AVE., LOS ANGELES 21



Rapidly nearing completion is the new plant that will be operated by Wyman-Gordon Products Corporation, a wholly owned subsidiary of Wyman-Gordon Company for the account of Reconstruction Finance Corporation, and will be available to aircraft manufacturers in particular and to industry generally for experimentation in and for the development and production of light metal forgings. In action here, at an early date will be the largest die forging press in the world (18,000 tons). This means for aircraft reduced weight which, in turn, means increased pay-load and greater performance for American planes . . . And for industry in general—complete range of magnesium and aluminum forgings.

WYMAN-GORDON
PRODUCTS CORPORATION
WORCESTER, MASSACHUSETTS, U. S. A.

New Britain
Specialty Co.

From-
Rubber Garter Buttons

To-
Rubber Tobacco Pouches

Rogers
"Air-tite" Tobacco Pouch

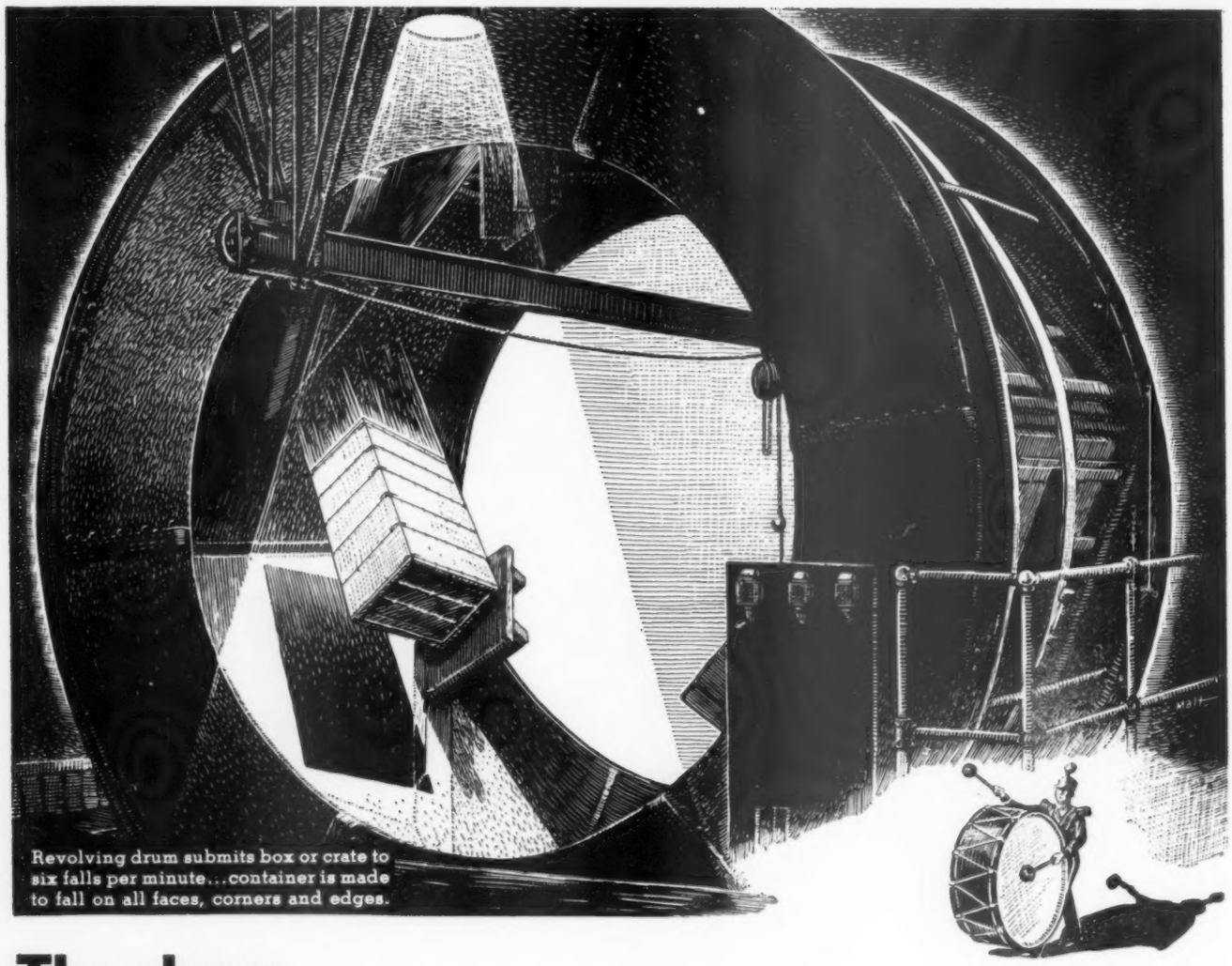
From garter buttons to tobacco pouches . . . from goggle frames to faucet sprayers . . . from oil seal rings to dust boots—these are only a few of the innumerable precision-molded parts we are constantly producing in our extensive, modern plant for large and small manufacturers throughout the country.

If it can be molded of RUBBER—ACUSHNET will mold it! Specialists since 1910 in processing, compounding and molding rubber, we are equipped to design and precision-mold, exact to specifications, parts or products of natural or synthetic rubber.

We welcome all inquiries. When writing, please include complete information, specifications or samples.

Background illustration:—a "heat" of rubber garter buttons produced in a multiple mold. Button and strip is cut for attachment to garter.

Acushnet PROCESS CO.
New Bedford, Mass., U.S.A.
Precision-Molded RUBBER Parts & Products



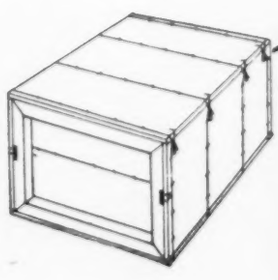
Revolving drum submits box or crate to six falls per minute...container is made to fall on all faces, corners and edges.

The drum does the beating!

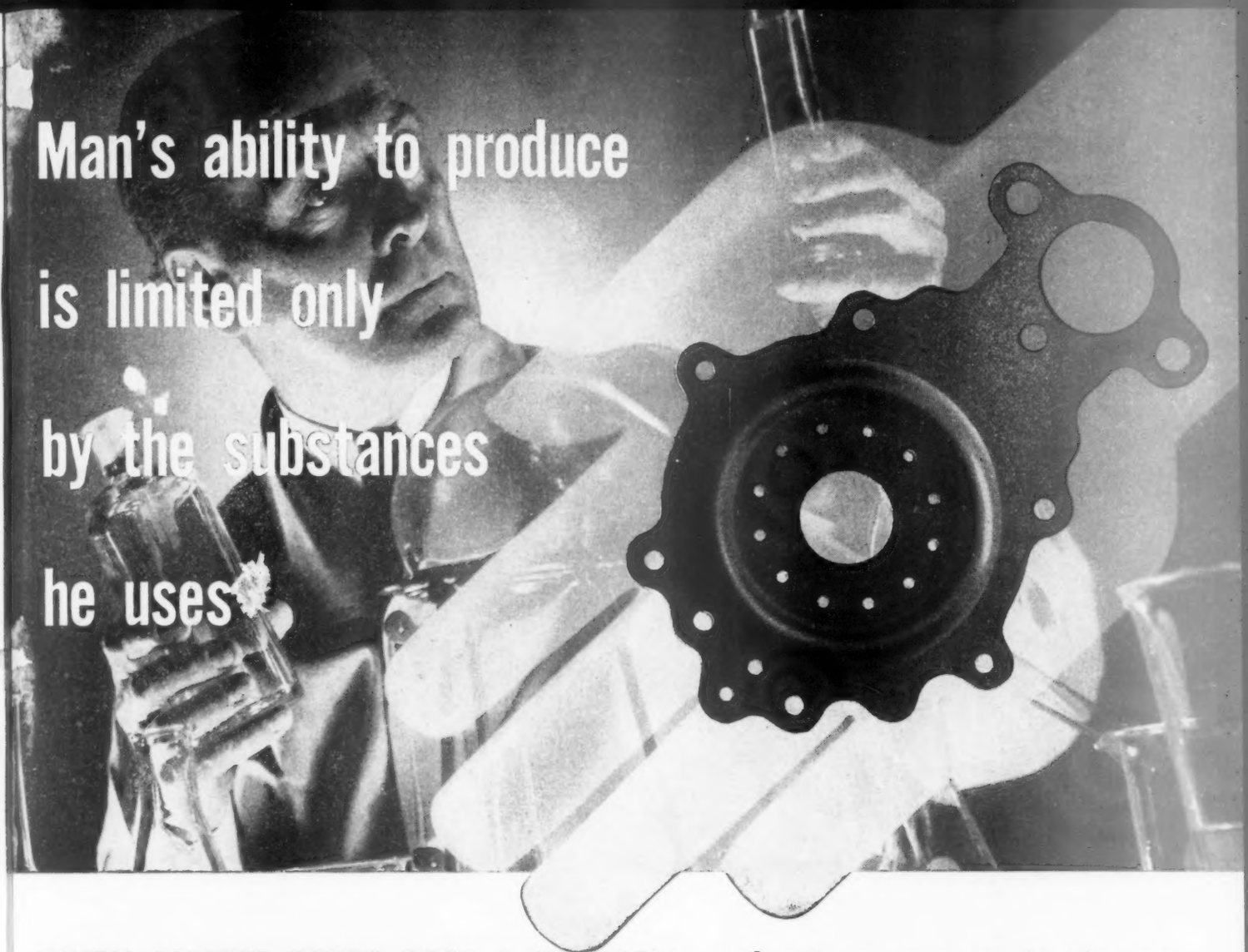
This mammoth revolving drum gives a scientific "beating" to the Wirebound Box or Crate designed to carry your product . . . a successful test run on this machine means that your shipments in Wirebounds will withstand the knocks, the bumps and the jars encountered in actual handling and shipping.

Write today for 24-page factual booklet on how Wirebounds can help ship your product safely . . . *and at lower cost!*

WIREBOUND BOX
MANUFACTURERS
ASSOCIATION
Room 1821
Borland Bldg.
CHICAGO 3, ILL.



Wirebound
BOXES & CRATES



WHEN PLIABLE PARTS POSE A PROBLEM . . . *there's an answer in Sirvene*

When you need exceptional assurance of extraordinary dependability under peculiar or extremely tough working conditions . . . when you have to have maximum flexibility combined with utmost stability . . . when you need resistance to oils, acids, chemicals, water, sunlight, heat or cold . . .

. . . in short, when you want the last word in performance of pliable parts, Sirvene engineers will develop the necessary special formula for you. Then, the precision production methods used to make Sirvene parts guarantee absolute adherence to your specifications, regardless of size or quantity.

SIRVENE

THE *SCIENTIFIC* COMPOUNDED ELASTOMER

A Product of the Synthetic Rubber Division

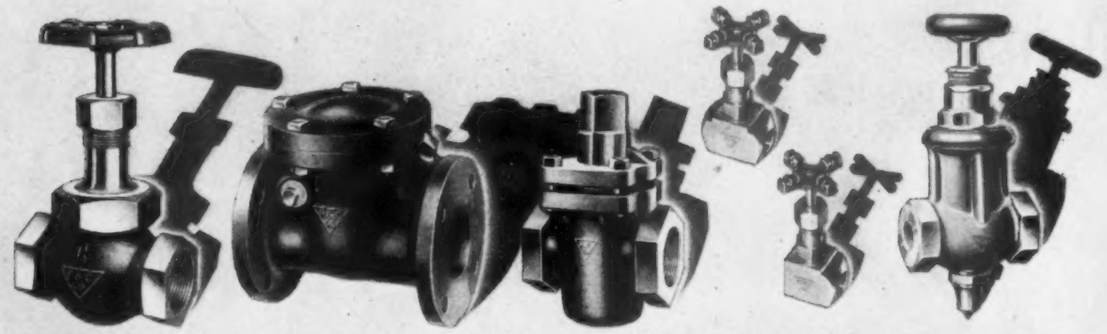
CHICAGO RAYON MANUFACTURING CO.

1305 Elston Avenue Chicago 22, Illinois

Sirvene Engineers are pioneers in the field of scientific compounded elastomers. Since 1929, they have acquired an unequalled background of research, development and manufacturing experience. This unique reservoir of experience is at your service.

THE WAY TO BETTER VALVES

READING-PRATT & CADY



Globe Valve—with renewable slip-on disc—patented by Pratt & Cady.

Swing Check—patented by Pratt & Cady.

Asbestos-Packed Cock—introduced in U. S. by Pratt & Cady.

Bar Stock Globe and Angle Valves—originated by Reading-Pratt & Cady.

Piston Internal Pilot Controlled Automatic Regulating Valve—originated by d'Este.

During the last century, when the now ordinary valve types were being originated and patented, Pratt and Cady contributed, among others, such items as the slip-on disc for globe valves and the swing type of check valves. d'Este originated the piston internal pilot controlled regulator. This activity continuing to present times is illustrated by the bar stock valves originated by Reading-Pratt and Cady.

And when early in this century, a need developed for a valve material other than brass and iron and the available steel castings proved inadequate, Reading specialized and pioneered in the development of the art of producing steel pressure castings. That development has been continuous, particularly as the requirement for alloy steels has appeared and increased.

The way to better valves is to continue development.

Reading Cast Steel Valves and Fittings • Pratt & Cady Brass and Iron Valves
d'Este Automatic Regulating Valves • Helicoid Pressure Gages
READING-PRATT & CADY DISTRIBUTORS IN PRINCIPAL CITIES

ACCO

Reading, Pa. • Atlanta • Chicago • Denver • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Bridgeport, Conn.

TRADE MARK

READING-PRATT & CADY DIVISION
AMERICAN CHAIN & CABLE

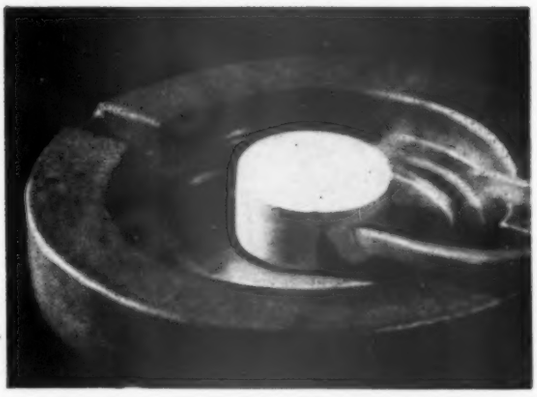
Anaconda HOT PRESSED FORGINGS
made by The American Brass Company

Illustrating the almost unlimited design possibilities in producing complicated or intricate parts of wrought Copper, Brass, Bronze or Special Copper Alloys. Additional information regarding this product appears on the following page.

Machined samples through courtesy of customers.

Here's how Anaconda Hot Pressed Forgings are made

1
a heated copper-alloy blank is centered in the die . . .



2
the dies close—with hundreds of tons of pressure . . .

3
and presto!—the metal is wrought into a semi-finished shape.

Of course, it isn't quite that simple. There are such matters as alloy composition, forging temperature, die design, trimming, piercing or sizing—but these are problems that we take care of.

and here's how they improve the product, reduce the cost

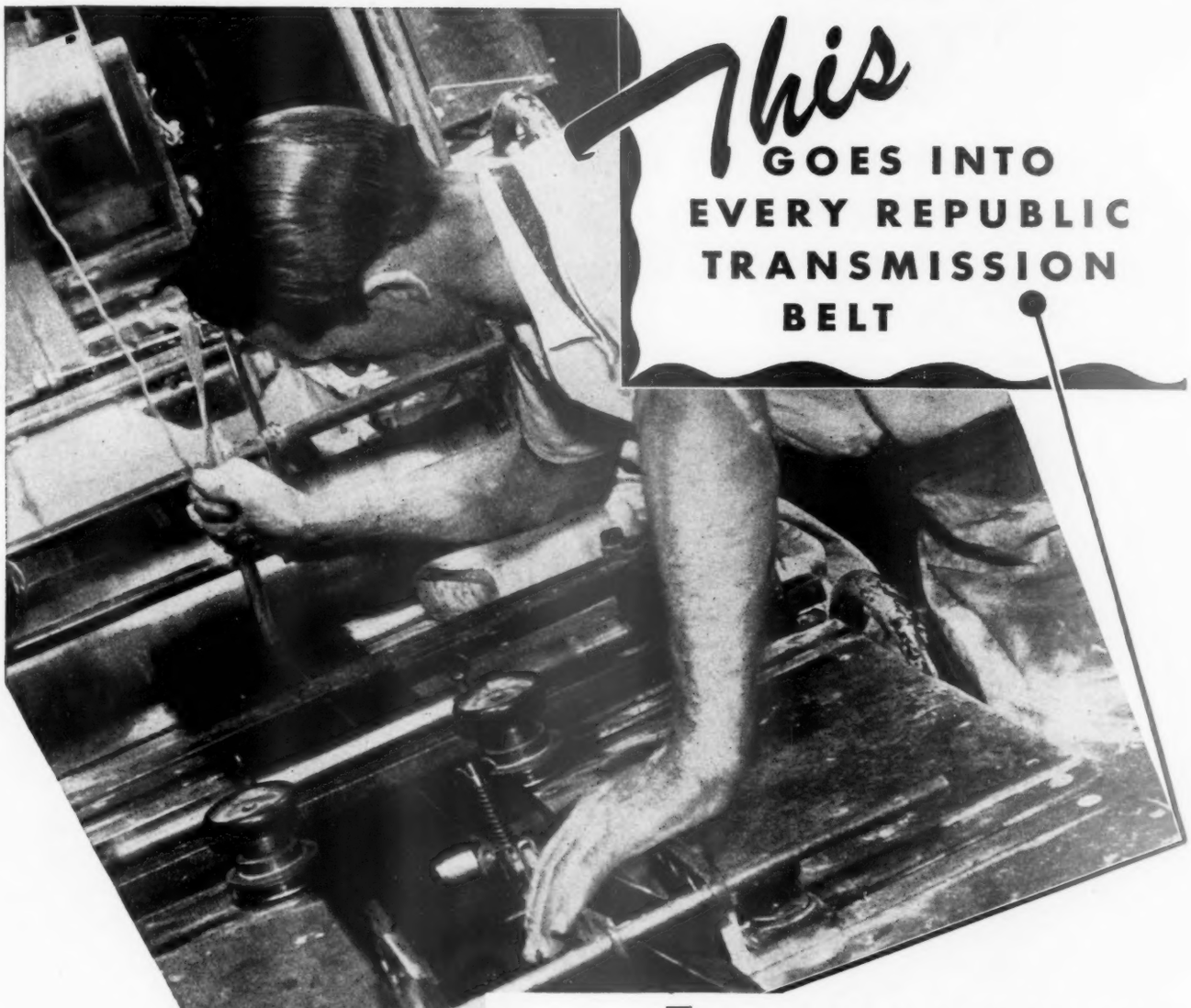
Anaconda Hot Pressed Forgings have twice the strength of sand castings—without the sand that causes needless tool wear. Absence of internal defects and a uniform, dense grain structure make them gas, air and watertight—able to withstand high pressures. Consistently accurate in dimension, they have a smooth, fine-textured surface and machine readily. Available in Copper, Brass, Bronze and Special Copper Alloys.

For typical examples of Anaconda Hot Pressed Forgings, see the preceding page. Inquiries regarding specific metallurgical, design, cost or production information will be given prompt attention. 45161

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

ANACONDA *Anaconda Hot Pressed Forgings*



This GOES INTO EVERY REPUBLIC TRANSMISSION BELT

THE QUALITY of a belt is dependent on selected materials, correct design and skillful workmanship. Here at Republic, the actual building of belting is rated high. These belt builders make sure of the proper impregnation of fabric, must keep the fabric in alignment and under uniform tension, and use care in the location of seams. Experienced workmen watch the heat and necessary tension during controlled vulcanization. When you order from your Republic Distributor, you get these well-built belts.

REPUBLIC RUBBER

DIVISION

LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
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LEE DELUXE TIRES AND TUBES
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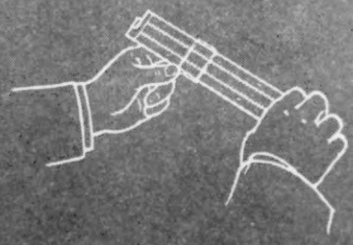
SPRINGS WITH Engineered PEP and POWER!



THERE'S many a mechanism today doing a *better* job—*longer*—because of specialized engineering principles applied to the springs. Automatic mechanical action calls for springs with the PEP to produce continued repetitive action, and the POWER to perform the desired function. Only sound engineering can provide *both* for individual performance requirements.

We have seen this in mechanical developments of the past. The unparalleled demands of this war have demonstrated it to a remarkable degree. Improvements and new devices to come will benefit from just such knowledge.

Make sure you get the best mechanical action by using Barnes-made springs with *Engineered Pep and Power.*

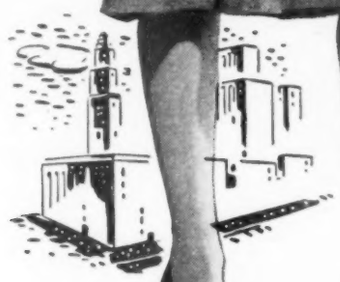
WALLACE BARNES COMPANY DIVISION OF ASSOCIATED SPRING CORPORATION BRISTOL, CONNECTICUT, U. S. A.

IS YOUR PRODUCT *Style* CONSCIOUS?

The boot, shoe and slipper industry buys nearly a half billion* set-up boxes every year. Yes, it's a lot of boxes and it has almost 100% coverage of the entire industry. Long a favorite for safe, convenient shipping and shelf display, the industry expects to make their boxes even more sales conscious in a business which expects to expand 20% in two years over prewar levels.

From fancy slippers in gold, silver and brilliant color cushioned in velvet boxes, to the heavy duty work shoes, the set-up box has enabled the dealer to emphasize finer grade footwear, better packaged. Manufacturers at the present time are planning greater use of color and product identification for greater take-home value.

* Consult your nearest paper box manufacturer. Ask him for the latest packaging survey (Dept. 22), "Boot, Shoe and Slipper Industry".



NATIONAL PAPER BOX MANUFACTURERS *Association*

AND COOPERATING SUPPLIERS

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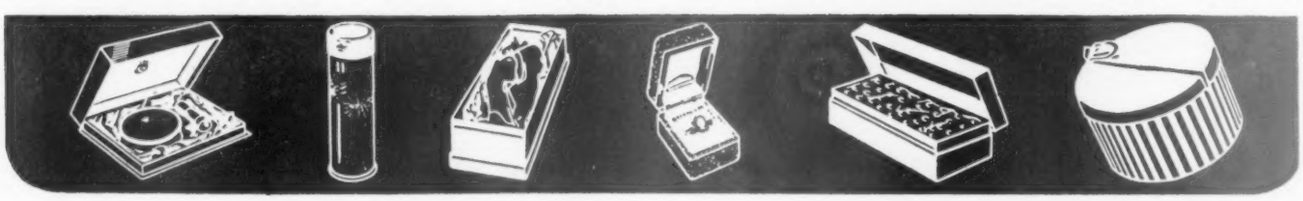
FOR INFORMATION OR SERVICE • CONSULT YOUR NEAREST SET-UP BOX MANUFACTURER



Photograph, courtesy of United Aircraft Corp.

When there's work to be done on the versatile, powerful Chance Vought F4U-4 Corsair, it is dressed in a "fatigue uniform" of sponge rubber.

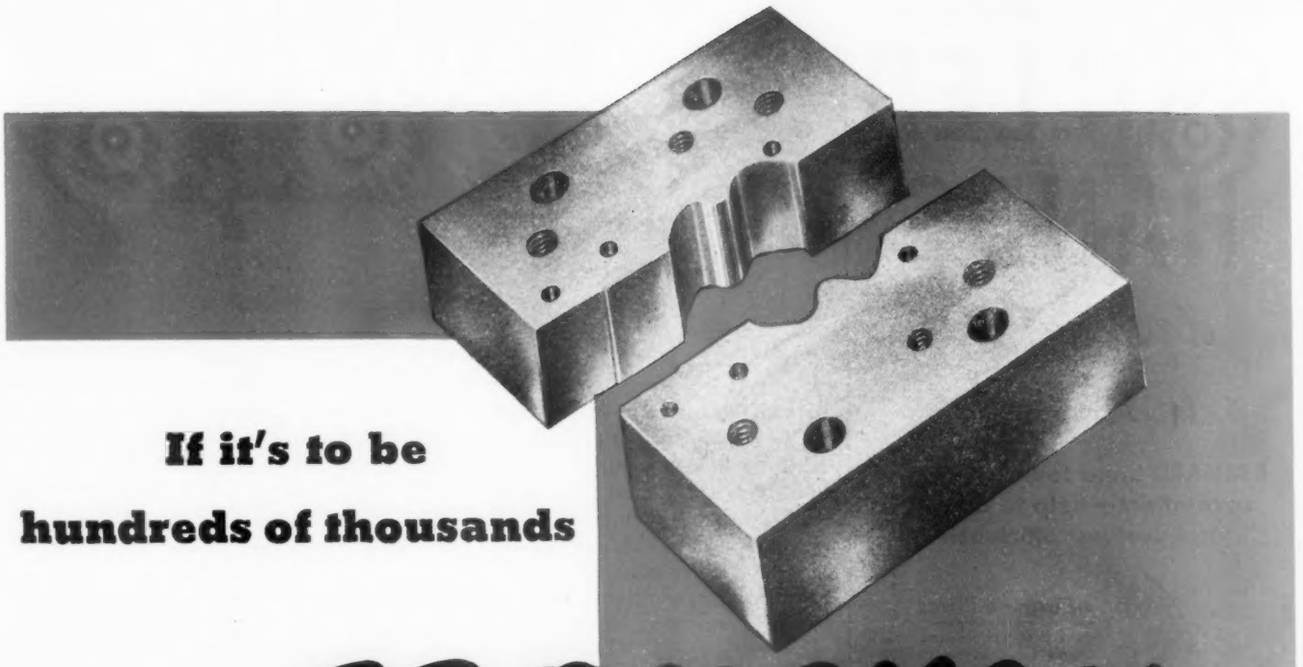
This workmanlike accessory is canvas bound, treaded with rope, and equipped with harness to hold it securely in place. The resilient thickness of sheet sponge rubber is an effective protection against scuffs and dents on the mirror-smooth, thin aluminum skin of the wing. More than that, the mat gives the mechanic a sure footing when the engine is revved-up in a test. As a result, there has been a decided drop in fractures and sprains due to slips and falls.

Developed as a wartime measure, this is an example of the tasks that cellular rubber, in one or another of its many forms, will perform in peacetime use. We have specialized in cellular rubber production for almost a quarter century and have never experienced such a demand as at present. We may not be able to fill your needs right now but hope you will keep this universally useful material in mind in designing products for future production. Sponge Rubber Products Co., 132 Derby Place, Shelton, Conn. Sales Offices: New York, Chicago, Detroit.

SRP

SPONGE RUBBER PRODUCTS CO.

SPONGEX* CELL-TITE* *TRADE MARK REG U.S. PAT. OFF. TEXLITE TEXLOCK

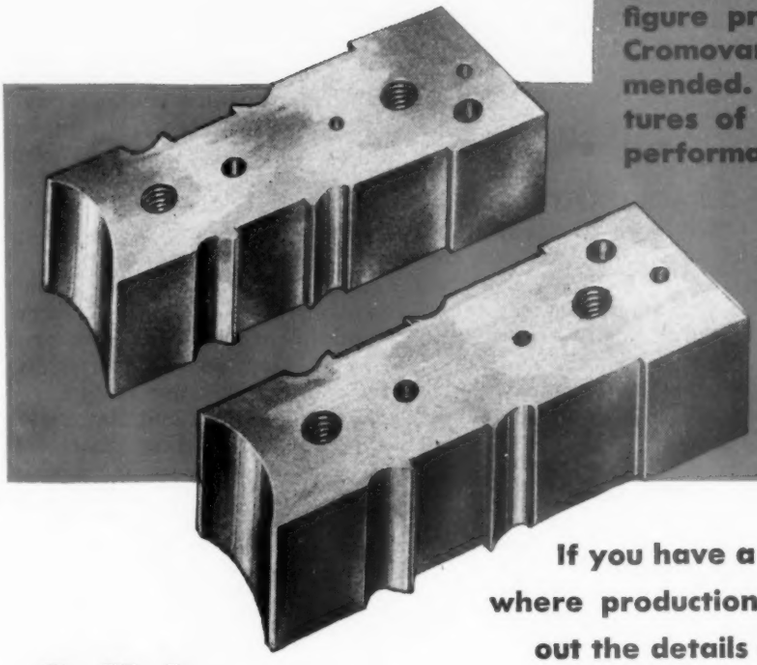


If it's to be hundreds of thousands

use CROMOVAN STEEL DIES . . .

Where it is advantageous to have dies that will assure big figure production and extra long life, Cromovan Triple Die Steel is recommended. The following outstanding features of Cromovan dies are proved in performance histories:

- **minimum dimensional change during hardening**
- **intense hardness from air cooling or oil-quenching**
- **unusual depth of hardness**
- **high resistance to abrasion**
- **good machinability**



If you have a cutting or forming operation where production requirements are unusual—find out the details about Cromovan's possibilities.

Call in

Firth-Sterling STEEL COMPANY

OFFICES: McKEESPORT, PA. • NEW YORK • HARTFORD • PHILADELPHIA • PITTSBURGH • CLEVELAND • DAYTON • DETROIT • CHICAGO • LOS ANGELES

SKILLED HANDS

deserve the best tools

BERNARD hand tools save time, save effort—help to achieve vital postwar efficiencies.

3-Purpose Pliers

As Wrench—parallel-action jaws close like a vise, hold FAST. **As Cutter,** blades on *outside* of head, convenient to use. **As Pliers,** open throat is ideal for use with wire. Compound action gives over twice the cutting and gripping power of conventional design.

Combination Slip-Joint Side Cutting Pliers. Full forged from alloy steel. Long, narrow, serrated concave grip. Heavy pin rivet accurately fitted. Black steel finish. An ideal, rugged tool for the mechanic

Chain Nose Cutting Pliers. Electric furnace, nickel chrome alloy steel, drop forged. Machine tapered noses, uniformly hardened and tempered. Corrugated gripping surfaces. Temper black handles. A fine tool for the electrical worker.

These are but three typical numbers in the BERNARD line. *Order through your distributor.* And send for FREE catalog illustrating and describing more of our hand tools that improve and speed up production operations. Use coupon below.

BERNARD

Wm. Schollhorn Co., New Haven 9, Conn.

"Quality Tools Since 1870"

Wm. Schollhorn Co.,
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Sirs: Please send me your free catalog of pliers, nippers, punches, cutters, and related tools for industrial use.

NAME.....

STREET.....

CITY.....STATE.....
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F.O.B. filosofy of buying

THE ultimate of absurdity has been reached in respect to the alphabetical designation of governmental agencies, and if you are one of those who have conscientiously tried to keep track of what the mystic initials stand for, you can fold up your note book. For ALSOS, a War Department "mission" devoted to the investigation of scientific progress in enemy countries, has no official interpretation. Or if it has, it's a military secret. Some erudite classical scholars point out that the word *alsos* is Greek for "groves", and hazard the guess that this may be a subtle allusion to Major Leslie R. Groves, who headed the atomic bomb project. More cynical commentators opine that the boys in Washington finally ran out of letters and that the ALSOS scientists were *also* to be included. And there are a few who contend that it's pure code—or pure gibberish.

• •

FRANK FARRINGTON writing in *Office Appliances* on some phases of salesmanship, makes the revolutionary observation that "There are dumb-bells among salesmen *as well as among buyers.*" A back-handed compliment if we ever heard one. Yet presumably the humble purchasing man should be grateful for this grudging admission that he has no monopoly of responsibility for the shortcomings of distribution.

• •

HATS off to Orville Starke, Purchasing Agent for the Holeproof Hosiery Company, who is doing an outstanding job of morale building and rehabilitation at the army's Thomas M. England Hospital at Atlantic City and among the discharged servicemen in his home city of Milwaukee, who have lost an arm or a leg. His own empty right sleeve is tucked neatly into his coat pocket, since he was run over by a street car when he was a youngster. Yet he went on to become a track star at high school, Marquette University and the Wisconsin Athletic Club, winning more first places than seconds and thirds, and topping off his performances with a tie for the world's indoor record in the 50 yard dash at the Northwestern University gym. He also played two seasons of semi-pro baseball as a pitcher and outfielder. Since then, he has proved himself a competent and successful business man, and has made it a hobby to pass his philosophy of courage and accomplishment to others in a similar condition, and has touched literally hundreds of lives with the inspiration of his example. Says the Milwaukee *Journal:*

"Starke was just the man the army was looking for to put a zest for life back into depressed amputees. He was a civilian, he had no connection with the government. He had made a success in many fields.

"He was just the kind of a guy to walk into the Thomas M. England Hospital and say: 'Look at me, lads. I'm as good as any man with two hands and two legs. I can lick 'em at any game—and so can you if you've got any spunk.' "

A general letter he has prepared mentions the "seeming physical handicap" of the loss of a leg or an arm. "I say 'seeming' advisedly," says Starke, "because as time goes on you, like I, will find that the loss of a limb is no handicap whatsoever. In fact, many of you men will find it a thrilling challenge to better your position in life."

• •

CITY Purchasing Agent William J. Ruddy of New London, Conn., has been having clock troubles, attributable at least in part to this unusually rugged New England winter. When the gears of the town clock froze in cold weather, he enlisted the aid of the Fire Department men, who put up their ladders, knocked the mechanism loose, and got it going again. At last reports, he was still wrestling with the problem of getting it to strike the hours, apparently a more chronic ailment

of some months duration, which failed to respond to the administrations of the fire laddies.

• •

FOR nearly two years, Mrs. Mary L. Arnold has been serving as a military replacement in the office of City Purchasing Agent at Haverhill, Mass., an assignment she relinquished on the recent return of P. A. Charles Kelleher from his leave of absence in the military service. Her record has been an excellent one, and she passes along something of what she has learned about the job in her valedictory report to the City Council:

It is a part of the purchasing agent's job to see that the city obtains value for what it spends. For the past eight months a daily record has been kept in order that definite figures may be arrived at as to just how much is saved and how the leaks can be further checked. Computations this year show a saving of approximately $15,000 in purchases through this office, which amounted to around $295,000. When business is normal much greater savings should be able to be effected. Also in years of buying heavy equipment, when it is available, the savings coud well be spectacular.

A purchasing department has such a definite place in the economy of maintaining a government that our purchasing department should be allowed to continue its growth until the ultimate in efficiency is attained. Toward this accomplishment, the following conclusions are presented:

1. Central buying is clearly connected with standardization of equipment. There is no doubt but that great savings could be made for the city by organized planning of the needs of the departments and standardizing wherever feasible.

2. There would be less duplication, less confusion, and greater efficiency if *everything* bought were routed through the purchasing department. Purchasing through one fountainhead that concentrates on getting the greatest value for the money spent, and working in conjunction with the heads of departments, would make for more satisfactory results all around.

3. There is still a large amount of emergency purchasing, so called. This means that purchases have to be made by resorting to convenience rather than a consideration of value. Some emergency buying cannot be avoided, but it could be greatly reduced by forward planning, organization, and coordination.

• •

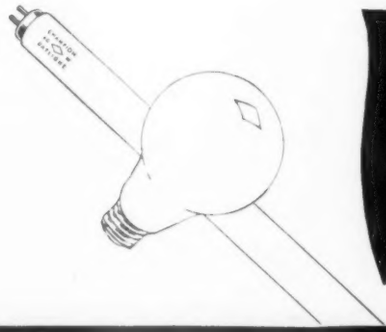
NEW YORK newspapers of December 22 carried the story of a Purchasing Agent who fell forty feet through an open sewer at Madison and 43rd, from which he was rescued by the prompt action of a Fire Department squad. One possible explanation is that he may have been desperate for materials and remembered the old story about the lucky persons who fall into sewers and come up bearing treasure.

WHEN YOU BUY
CHAMPION *Lamps*
HERE'S HOW MUCH MORE
YOU GET FOR YOUR MONEY

1 **Champion Quality**—the result of forty-six years of concentration on the manufacture of lamps for industrial service. Champion **Fluorescent** and ***Incandescent*** Lamps are guaranteed to *equal or exceed* Federal Specifications and backed by the production and quality control resources of one of the largest lamp producers in the industry.

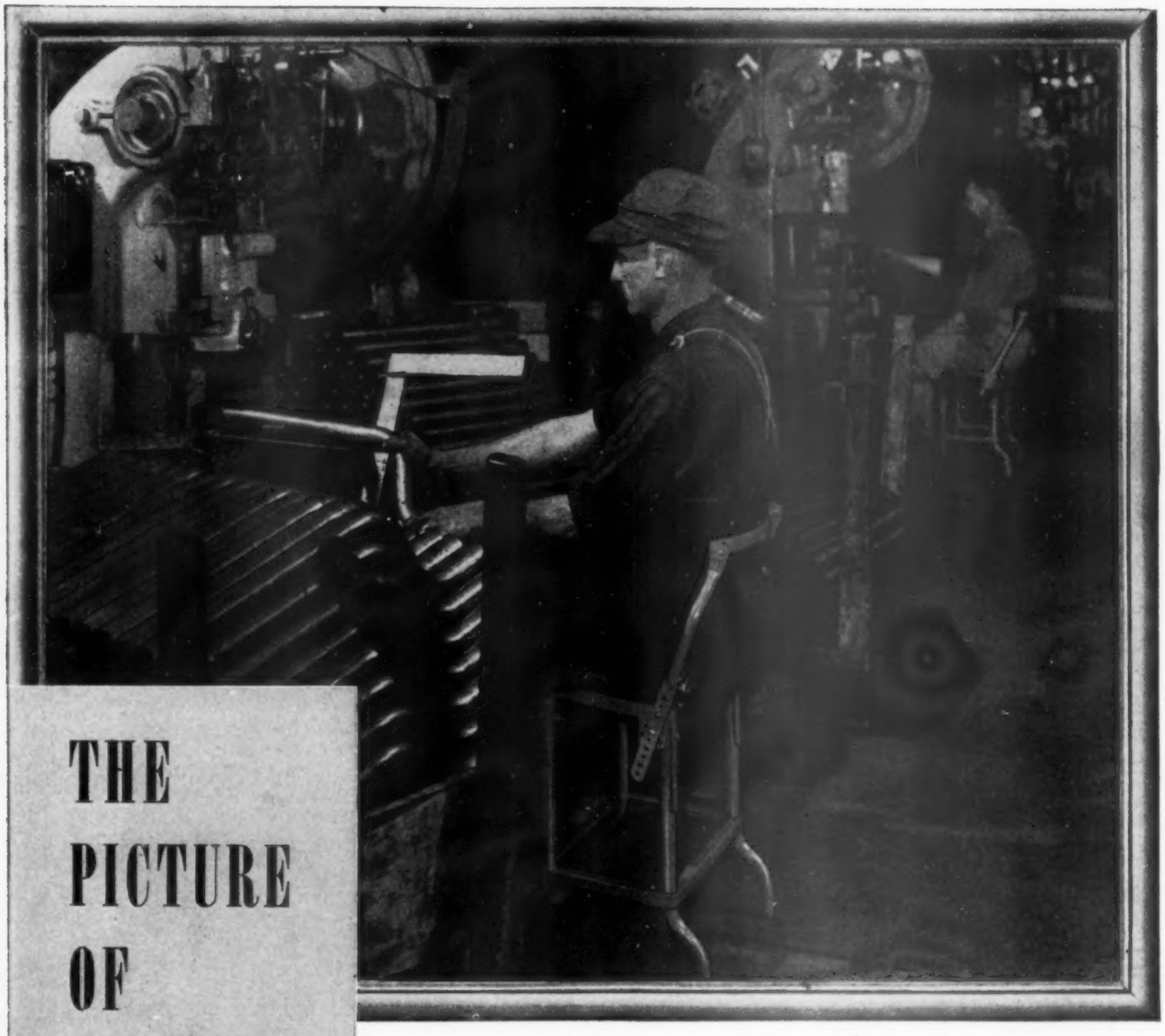
2 **Champion Economy**—the entire Champion manufacturing and distributing set-up is devoted to the job of getting lamps to you at minimum cost. When you standardize on Champion Lamps you can be certain of getting the most lighting and lamps for your money.

3 **Champion Service**—trained lighting experts in the field to help you on every lighting problem, and a carefully selected industrial distributor near your plant, ready and able to provide prompt, intelligent and economical attention to your lamp needs on the spot.



Try Champion Lamps and find out for yourself how much these extra advantages mean to you. Let us give you the name of nearest Champion industrial distributor.

CHAMPION LAMP WORKS
Lynn, Massachusetts
A DIVISION OF CONSOLIDATED ELECTRIC LAMP CO.



THE PICTURE OF COMFORT...

is easily worth 10,000 words on increasing workers' efficiency. The comfort of posture seating—the proper chair for worker and job—helps employees do better work faster.

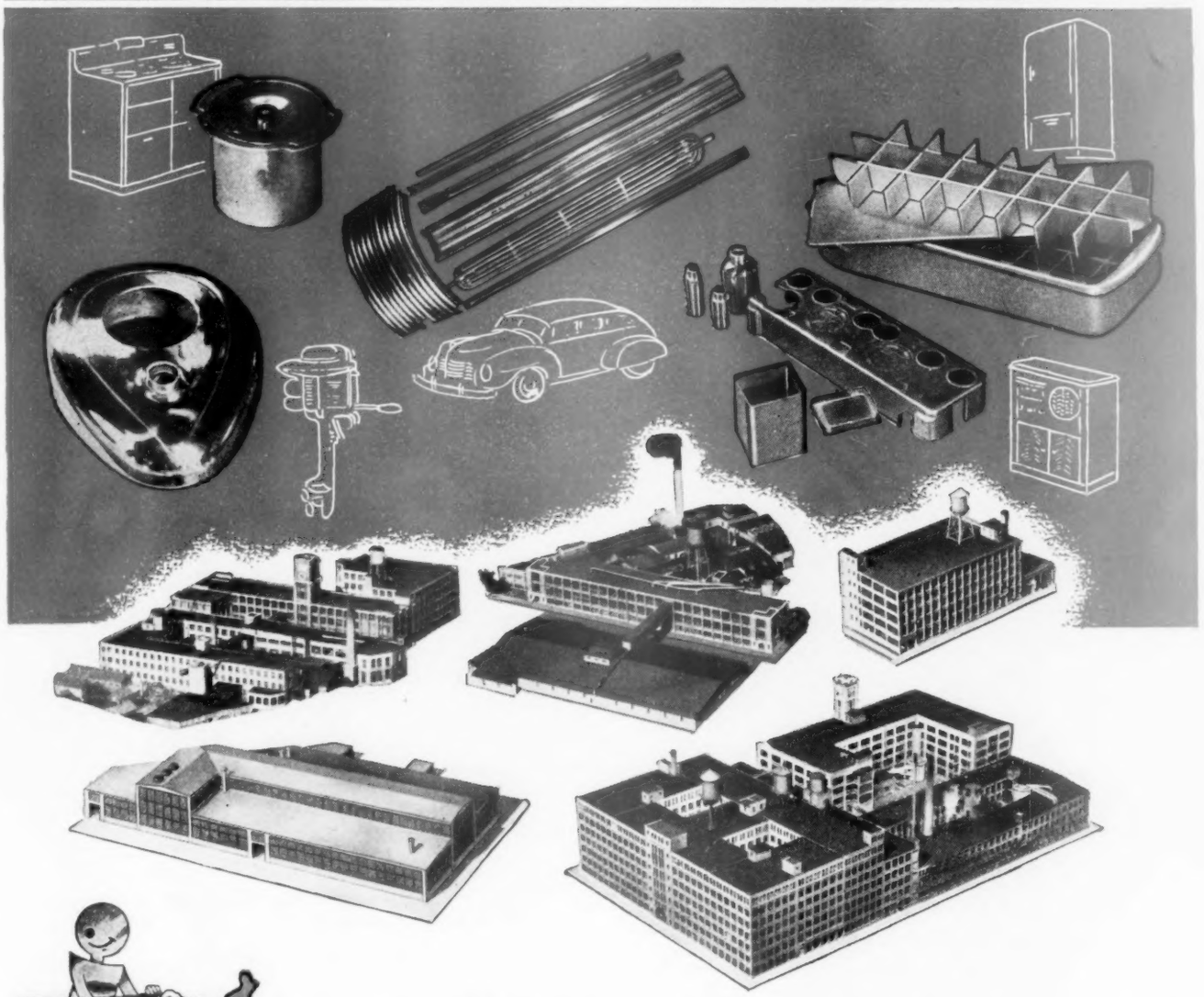
Harter builds steel posture chairs for all jobs—in factory, shop, and office. Every model features three adjustments: height of seat, height of back, and distance of back from the work being done. By permitting the worker to sit erect—comfortably balanced and firmly supported—these adjustments eliminate fatigue caused by poor posture and cramped muscles.

The engineering skill and quality materials which go into Harter Posture Chairs mean years of trouble-free service. Employers like their efficiency—workers like their comfort. Write for full details. Ask for the address of your Harter dealer. HARTER CORPORATION, STURGIS, MICHIGAN.

HARTER

STEEL POSTURE CHAIRS

Broad Experience... Complete Facilities



For a view of the widely varying kinds of war products we've been turning out...and for peacetime ideas they may start... write for free copy of photo-story.

"The Metal Men of Manitowoc" have won distinction for the production of thousands of items for scores of industries. This experience was materially broadened by the fabrication of over 400 war items—many of them highly complex. Our designers, engineers, chemists, metallurgists and craftsmen are equipped with complete facilities for aluminum and stainless steel fabrication.

- Four Large Fabricating Plants
- Spacious Aluminum Rolling Mill
- Complete Machine Shop and Die-Making Facilities
- Wide Range of Stamping Presses
- Annealing Ovens
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- Welding—Gas and Electric
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CONTRACT, AUTOMOTIVE AND AVIATION DIVISIONS

ALUMINUM GOODS *Manufacturing Company*

MANITOWOC WISCONSIN

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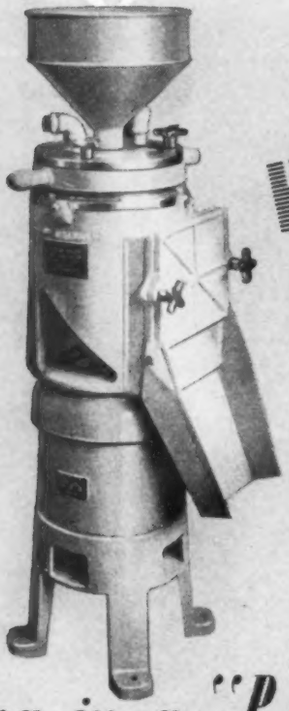
ALSO MAKERS OF MIRRO, THE FINEST ALUMINUM COOKING UTENSILS

BEGINNING OF THE END of high costs



HOMOGENIZING
EMULSIFYING
DISPERSING
GRINDING

Processing in a "PREMIER" Colloid Mill
Increases Production Economy and Efficiency
Improves Product Quality...Free Tests Made

The first step towards lowering processing costs has often been the use of a Premier Colloid Mill. Whether the materials to be improved are liquids, pastes or solids — performance establishes the economy of a Premier in emulsifying, dispersing and disintegrating.

A Premier Mill is a starting point for product improvement. Its intense shearing action affords thoroughness and uniformity in ingredient mixing, continuous homogenizing and fine grinding.

In many fields, purchasing agents recommend Premiers as having proved their value in actual service. Typical fields include adhesives, sealing compounds; asphalt emulsions; ceramic colors; coating and waterproofing emulsions; cosmetics; foods and beverages; oil emulsions; inks; leather finishes; latex — synthetic and natural; lacquer emulsions; lubricating oils, greases; pigment dispersions; organic chemical dispersions; paints, lacquers, varnishes; paper coatings, fillers, waterproofing; pharmaceuticals; plastics, resins; polishes, waxes; rubber compounds; textile finishes. (Special laboratory models are available for research work.)

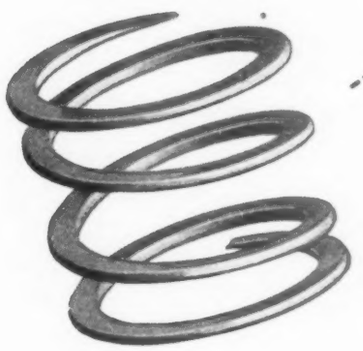
You can get a "Premier Preview", a free actual-performance test in our laboratories. Just ship your materials to us for a first-hand answer to "What can colloid mill processing do for me?" Premier Mill Corporation, Factory and Laboratory, Geneva, N. Y., General Sales Offices, 110 East 42nd St., New York 17, N. Y.

Descriptive Literature on Request

THE PREMIER MILL

Better products more profitably processed

Measure of a good spring

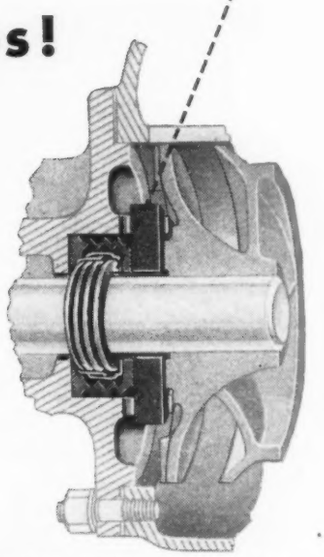


—is the company it keeps!

Schwitzer-Cummins is another great name on the long list of Muehlhausen customers. Muehlhausen Springs are one of the quality parts contributing to the famous reputation of this Company's products.

The use of the right spring is vital to sustain the reputation of any company's products. This is particularly true today when the battle of bullets is over and the battle for business is just beginning. Competition will demand not only a superior but a trouble-free product.

MUEHLHAUSEN SPRING CORPORATION
(Division of Standard Steel Spring Company)
675 Michigan Avenue, Logansport, Indiana



SCHWITZER-CUMMINS AQUA-TITE SEAL

SCHWITZER-CUMMINS AND MUEHLHAUSEN ADD QUALITY

TO SCORES OF WELL-KNOWN PRODUCTS!

Four million Aqua-Tite Seals in one year is the record of Schwitzer-Cummins. That's a lot of seals, and such production called for a multitude of specially designed Muehlhausen Springs. Such large volume indicates the satisfactory performance of this spring-designed seal on heavy-duty trucks, autos, tractors, and other vehicles.

***To improve product performance, use* MUEHLHAUSEN Designed SPRINGS**

NEWS!

LOAD-LOK* ADHESIVE ENDS SHIPPING LOSSES!

*Reg. applied for

Properly Glued Carload Shipments Show Breakage Reductions Up To 100%

Here's the shipping record proof of one industry. A *seven carload liquor shipment shows:* 1 car — 5 bottles broken; 1 car — 2 broken; 3 cars — none broken; 2 cars — one broken in each. A *three car shipment shows:* No breakage. Yet previous unglued shipments show a breakage average of 30 to 120 bottles per car. A *1700 case shipment of quart containers shows:* 4 broken bottles. Previous unglued breakages ran as high as 90 bottles per car.

All of these glued-load shipments were long distance. All were properly unitized with *LOAD-LOK!*

LOAD-LOK is a special National adhesive. It *unitizes* the loading of canned goods, light bulbs, china, bottled goods and all other fragile or crushable materials — regardless of their containers. Carload and truckload shipments are *unitized* into floating *glued loads* that successfully withstand side sway and all shocks of car movements . . . and greatly reduces dunnage and bracing.

LOAD-LOK is automatically applied in two parallel strips to the bottom surface of each shipping unit . . . which is then lifted off your regular loading conveyor and glued into the *unitized* load. LOAD-LOK has a high shear strength which prevents sidewise or lengthwise shifting of the stowed units. Yet, a single sharp upward blow of the hands, against its low tensile strength, releases each unit for easy unloading. The glue cost is insignificant. And the only equipment required is an inexpensive glue pan installation on your loading conveyor.

LOAD-LOK has been endorsed by leading carriers for both small and large shippers. Full details of this new handling practice are available in a new handbook: GLUED LOADS. Write for your copy — NOW!

Offices: 270 Madison Avenue, New York 16; 3641 So. Washtenaw Avenue, Chicago 32; 735 Battery Street, San Francisco 11, and other principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto. In England: National Adhesives, Ltd., Slough.

National ADHESIVES

National also produces adhesives for: Bottle Labeling, Can Labeling, Carton Sealing, Package Wrapping, Shipping Case Sealing and Labeling, Revenue Stamping, Box Forming, Bag Making, Tube Winding.

Purchasing Previews

A Washington Report . . . . . for Purchasing Agents

FEBRUARY 1, 1946

GOVERNMENT FORECASTS HAVE GONE ASTRAY . . .

Industrial economy has not followed the pattern laid out for it by Government economists.

The labor market has held firm——which, in effect, upset forecasts of a marked drop in purchasing power. Labor difficulties have accentuated shortages, and have generally been the most disrupting influence in the reconversion picture.

On the one hand, demand has remained firm and increased, and on the other, there has been a direct cut in estimated supplies as the result of strikes.

The question which has been asked repeatedly is how the estimates of an 8,000,000 unemployment level by spring of this year——as forecast shortly after the end of the war——could have gone astray.

CAPITAL GOODS EQUIPMENT OUTPUT AT HIGH LEVEL . . .

One explanation is that the forecasts did not take into account the phenomenal production levels in capital goods equipment.

Most producers of capital goods equipment did not have pressing physical reconversion problems. Producers of railroad equipment reconverted and were in high level production quickly. Employment in these plants is high. Producers of capital goods equipment such as printing trades equipment, textile machinery, food packaging machinery, bounded up quickly in both their dollar volume of product and in their employment opportunities.

During normal periods the output of capital goods equipment represents roughly one-third of all metal-working industries——with consumer goods making up two-thirds. The current reports show capital goods production representing about one-half of the volume.

The demand for tools and equipment of all kinds will continue heavy. In some fields, it will actually increase, even though current activity is much beyond prewar levels and in some cases considerably above peak war levels.

However, the overall forecast is for a leveling off, possibly at a somewhat lower level in the capital goods equipment field, with the consumer goods production slated to step up to very much higher rates.

FILLING THE DISTRIBUTION PIPELINE . . .

Reason for the scarcity of goods is two-fold. The distribution pipeline requires a lot of filling. It is bare, and merely supplying floor models of most items for the many retail outlets requires a high level of production.

In addition to floor models, retail sellers require sufficient stock for quick delivery in the various styles

and price ranges available from the manufacturer. With buyers at the other end ready to snatch everything off the shelves, the pipeline is constantly drained off, making it impossible to develop the backlog of supply necessary for normal merchandising.

Coupling the current high rate of capital goods production with the anticipated high rate of consumer goods production, result should be a production level that will provide employment for veterans as they return, and keep unemployment figures at a low level.

On the supply side, the high rate of buying will mean that the market will continue heavily weighted in favor of the seller.

GOVERNMENT POLICIES WILL GEAR TO DEVELOPMENTS . . .

With these developments in view, the Government is continuing its policy of trying to gear into industrial activity, instead of attempting to call the tune.

Government agencies do not have the same degree of access to information concerning industry now as they did during the war. Industrial information currently comes to Government by courtesy of cooperating companies, rather than through mandatory reporting forms.

Economists in the Government have to take the normal indices as the source of their information, and as a result are in the position of educated observers.

Government is in the position of taking steps only when requested to do so by either industry or the consumer, or when in singular instances it is forced to do so in the public interest.

When a crisis develops, Government reestablishes some of the controls which it exercised during the war. Examples of the latter are the textile and consruction controls.

While Government has reappeared in the picture when severe shortages develop, this is generally looked upon as temporary. It is the consensus in Washington that by fall of this year, few traces of wartime controls will remain.

WILL REVERT TO SERVICE FUNCTION . . .

The function of Government when reconversion is fully completed will be that of a service agency, and in specific instances, as either a supplement to existing private institutions or a guarantor of private credit.

Outstanding exception will be the disposal of surplus property, where the Government will continue to operate as an active seller.

Government agencies with a strictly war purpose are dropping out of the picture quickly. The Smaller War Plants Corporation, War Labor Board and War Food Administration have been abolished. Remnants of their functions have been assumed by other Government agencies. WPB is no longer in the picture, and CPA is fading.

Rationing has diminished in importance to a point where OPA has been able to merge its rationing division into its price control organization.

Department of Commerce plans call for development of many of the service functions which Government could legitimately supply to industry. Many of these activities require appropriation of additional funds by Congress, but legislators have been slow to sanction the plans outlined by the Secretary of Commerce.

Reduces Handling Costs!

By using the *Acme Uni-Pak* method, packages, semi-finished parts, or finished products are shipped and handled in one unit. The use of *Acme Steelstrapping* alone or in combination with a skid or pallet makes this method possible. Acme Uni-Pak lowers handling costs for you and your customers and increases shipping protection.

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY

ACME STEEL CO.
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OLD MAN COMPETITION...

is getting ready

The right wire rope can help you keep costs down!

The heyday of high production, with cost a secondary consideration, is over.

All industrial equipment and supplies will have to be purchased with their cost-cutting possibilities a prime consideration. Equipment must *save* while it *serves!*

Wire rope in your business must do its part in cutting overhead too. Meeting competitive business, equipped with Roebling "Blue Center" Steel Wire Rope, is a *sure* step in this direction. The staying power and reserve strength of *any* Roebling Wire Rope, regardless of its type, is real economy over a long period of operation.

Unsurpassed facilities, research and practical engineering of America's pioneer wire rope maker, assure you top service in installation or maintenance. Roebling Wire Rope will help to remove the danger of costly shutdowns due to replacements . . . will help you profitably meet the coming years of competition.

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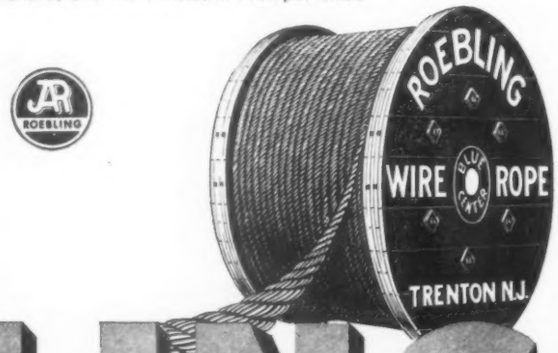

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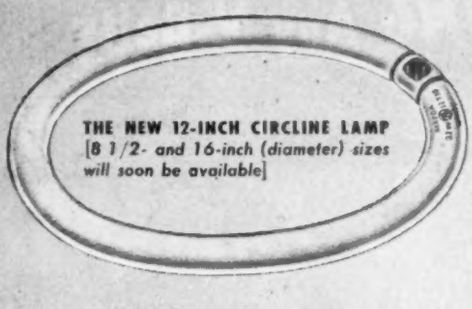
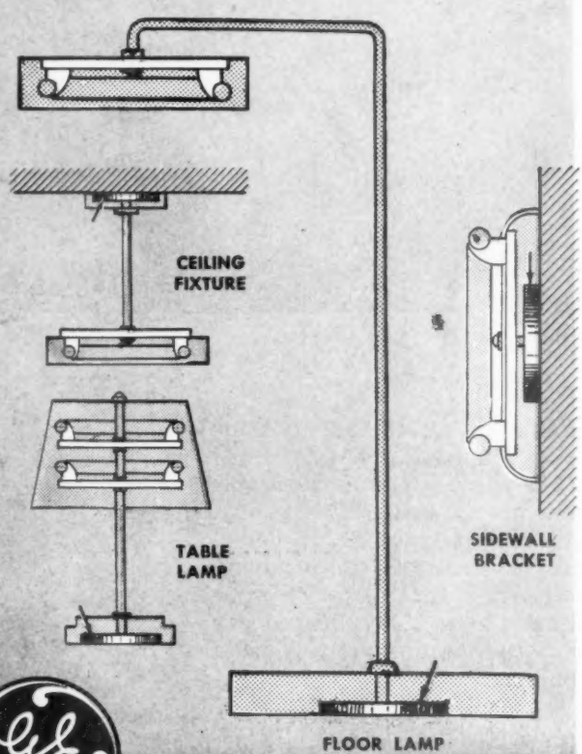
An Unusual Ballast for an Unusual Lamp



A few suggested applications of ballast and lamp



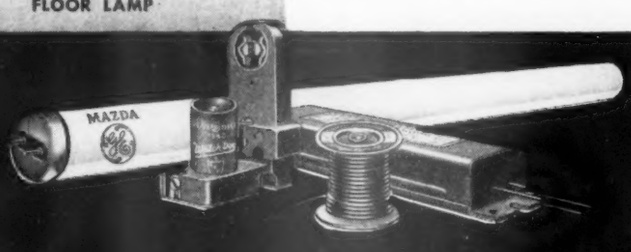
The disk shape enables you to use the Circline fluorescent lamp to fullest advantage in your new designs

THIS new ballast is functionally designed for easy use in your new portable lamps and decorative lighting fixtures.

The center hole of the ballast facilitates mounting on the stem of portable lamps. The ballast can be easily concealed in lamp bases, or in wall and ceiling fixtures. Connection to the fluorescent lamps is made by threading the ballast leads through the lamp stem.

This ballast is available in uncorrected- or high-power-factor, single-lamp ratings for use on 110- to 125-volt circuits. The uncorrected-power-factor design is 6 inches in diameter and 1 3/8 inches in height. The high-power-factor unit, of the same height, is 7 inches in diameter.

Write today for a copy of Supplement No. 3 to Publication GEA-3293F. It is a "must" for your file of postwar lighting ideas. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

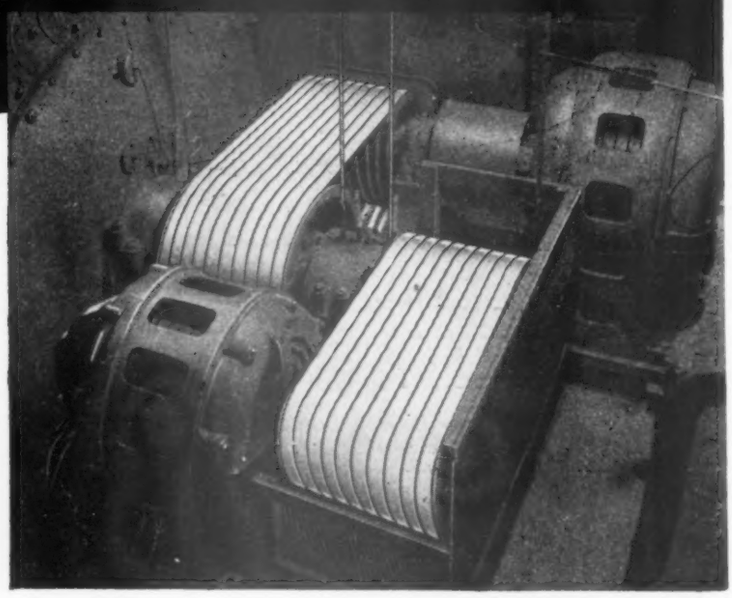


BALLASTS
LAMPS
STARTERS
LAMPHOLDERS
CABLE
for DEPENDABILITY in fluorescent lighting

It's the REASON for this Fact that's important

Your *Standard* GATES VULCO ROPES

Are Today **OUT-PERFORMING** Any V-Belts Ever Built Before



Early in the war it was found that **no** V-belts then being built by **anyone** could stand the combat-service requirements of the Army's tanks, tractors, and self-propelled big guns. For this unprecedented severity of service, Gates developed and built V-belts far stronger and more durable than any V-belts ever built before—and here is why this fact is NOW important to YOU:—

HERE is the reason

Every improvement developed by Gates for these Army V-belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

Here is one of the very few instances in which improvements developed primarily for military use were passed on immediately to you. Ordinarily, that could not be done. Gates V-belts were made an exception because it was recognized that industry needed the best possible V-belts in order to achieve the greatest possible production—and maximum production was one of the nation's vital needs.

That is why Gates has been able to pass on to you, day by day, every V-belt improvement developed for our armed forces during the war—and that is why your Standard Gates Vulco Ropes are today outperforming any V-belts ever built before!

All Gates V-Belts are Built With The Patented CONCAVE SIDE

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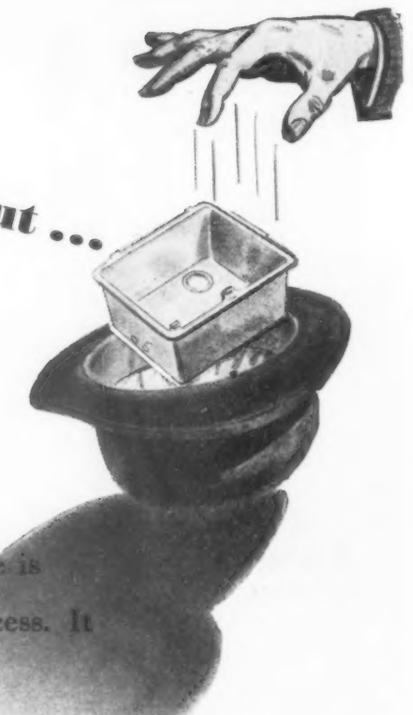
P. 2-46

The hat trick was a good one, but ...



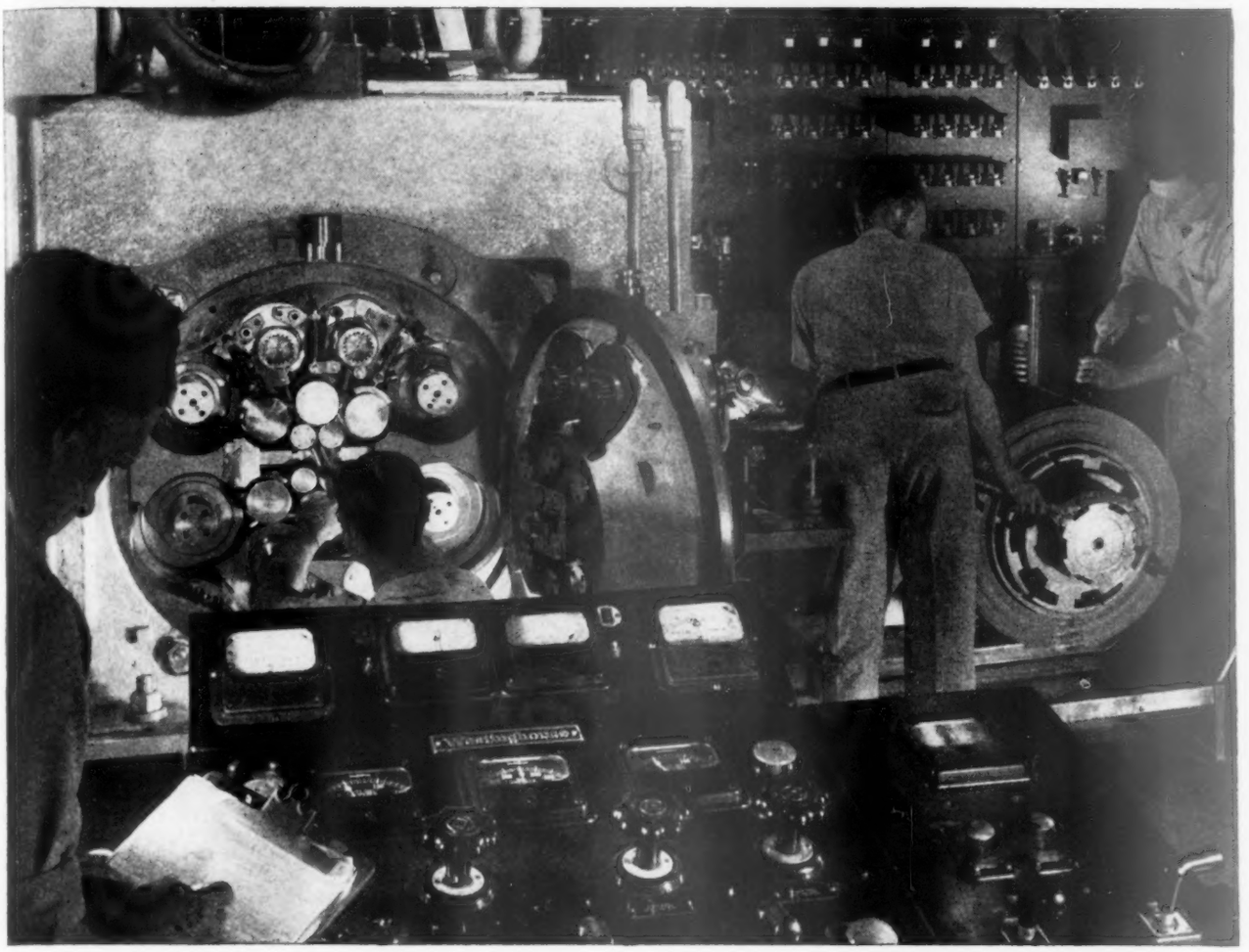
Alcoa Aluminum Permanent-Mold Castings long ago outgrew the "small" category

Do you still think of permanent-mold castings as "small enough to put in a derby hat?" The war changed that. The blower impeller shown here is typical of products made by this process. It weighs close to a hundred pounds.

Yes, BIG aluminum permanent-mold castings are now a reality. And Alcoa has the know-how, the equipment and the capacity for taking care of your requirements.

Because Alcoa permanent-mold castings carry little excess metal, they cut down finishing time and help speed your production. Aluminum Company of America, 1931 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM



Steel Sheets Thinner Than a Human Hair?

Yes . . . and they'll soon have a lot to do with many electrical products manufactured for home, farm and industry.

These special electrical sheet steels—thinner than this sheet of paper—are being made on the Armco precision cold strip mill pictured above.

During the war they were used in combat walkie-talkies and radar equipment. Now these ultra-thin steels are going into high-quality radio sets, television sets and other electrical devices.

This is one of the latest examples of research by Armco. Other special-purpose ARMCO Sheet Steels include Galvanized PAINTGRIP, a special mill-Bonderized sheet that takes and preserves paint; and ARMCO ALUMINIZED—an aluminum-coated sheet steel.

During 32 years of national advertising, consumers have been urged to look for the familiar Armco triangle trademark as assurance of longer life and greater economy in products made of sheet steel. They recognize Armco-identified products and buy with greater confidence. The American Rolling Mill Company, 711 Curtis Street, Middletown, Ohio.

The American Rolling Mill Company ARMCO **Special-Purpose Sheet Steels**

FASTER . . . MORE EFFICIENT . . . MORE ECONOMICAL

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With The

New ADJUSTA-BLAST-GUN*

FOR EVERY
INDUSTRIAL CLEANING JOB

HYPRESSURE JENNY STEAM CLEANING is the *fastest,* most *thorough,* most *economical* method known for cutting and flushing oil, grease, and dirt, from any surface. Cleaning is accomplished by a highly atomized mixture of steam, hot water and cleaning compound applied under pressure through the ADJUSTA-BLAST-GUN, a light, compact unit which gives the operator instant choice of the right type and the right amount of spray or water for any cleaning requirement. One man, using HYPRESSURE JENNY, can do more cleaning in an hour than 8 men can accomplish in the same time by outmoded hand cleaning methods.

JENNY has many uses and is a time and money saver in any plant or factory. For instance, JENNY STEAM CLEANING of machinery *before* repairs, cuts "down time" practically in half by saving up to 40% of mechanics' time usually lost wiping oil and grease from tools and equipment. JENNY also keeps mill and factory floors clean for safe, rapid plant traffic . . . provides better light by cleaning windows, walls, and skylights . . . lessens fire hazards.

Hundreds of manufacturing plants have adopted HYPRESSURE JENNY as the *fastest, most efficient,* and *most economical* method of doing all their cleaning jobs. There is a JENNY model to suit *your* needs, too. Why not let us send you detailed information and new low prices on JENNY STEAM CLEANERS and JENNY Cleaning Compounds?

*The ADJUSTA-BLAST-GUN

Present HYPRESSURE JENNY users will welcome the new ADJUSTA-BLAST-GUN, because it provides, in one light, compact unit, instant choice of the RIGHT type of spray for most any cleaning job. The operator, at all times, has, right at his finger tips, adjustable control of a spray which may be varied anywhere from HYPRESSURE JENNY'S powerful steam vapor spray for grease and dirt removal, up to an extra powerful 480 gallons per hour flushing or rinsing blast for removing stubborn mud and clay deposits, melting snow and ice, etc. And again, if you want a cold water rinse, a turn of the valve does the trick.

An ADJUSTA-BLAST-GUN, added to your HYPRESSURE JENNY, more than doubles the amount of cleaning work that you will be able to do, at NO INCREASE in the amount of fuel and electricity consumed, and with no mechanism added to the machine. ADJUSTA-BLAST-GUN, price complete, delivered **$35.00**

Hypressure Jenny Division

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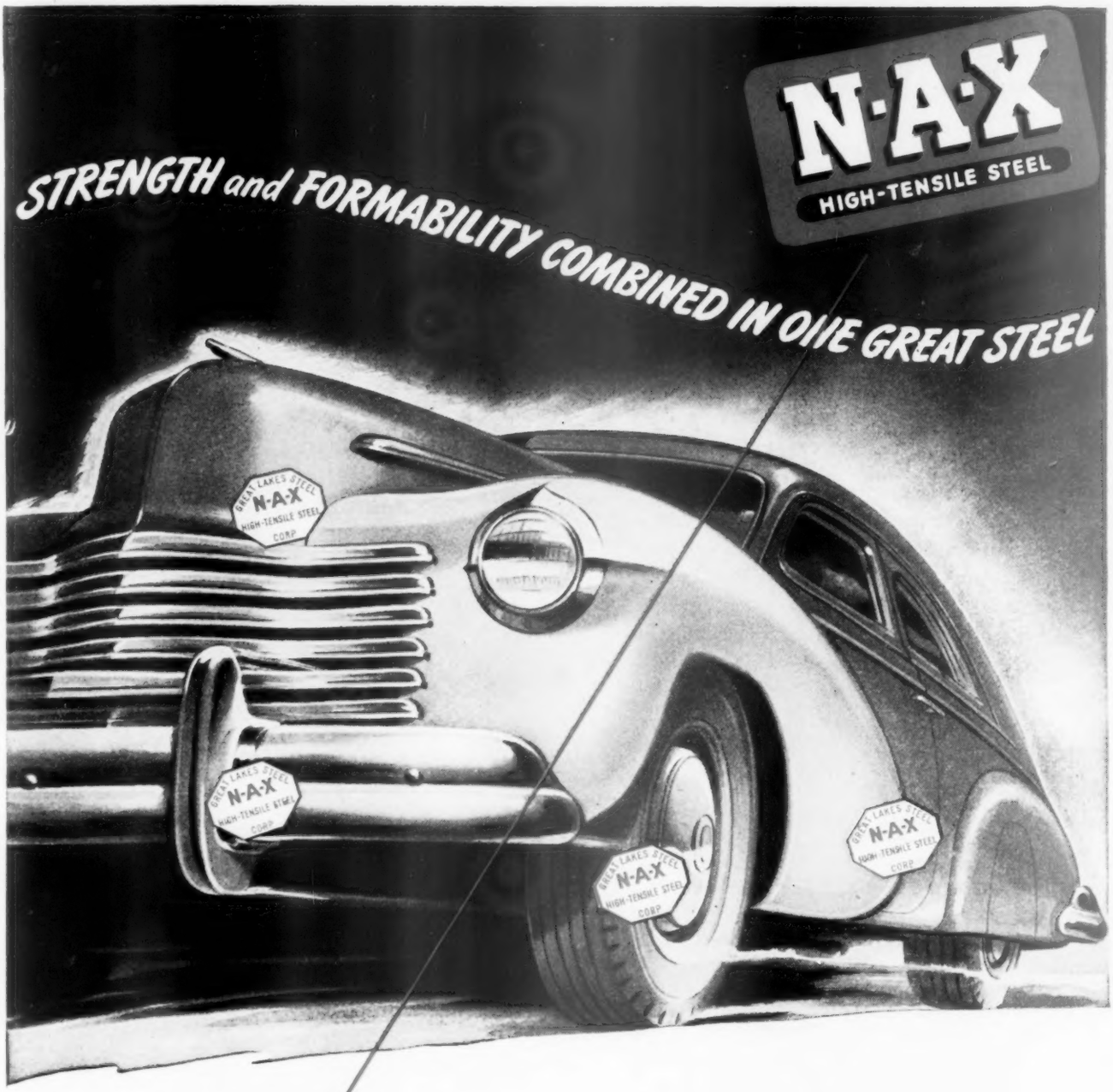

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You can now get rubber parts molded from Neoprene, Buna N, Buna S, Thiokol, or other synthetic materials. When natural rubber is again available, we will resume manufacture of natural rubber compounds for specific applications.

For application data on molded rubber parts and other Armstrong's sealing materials, send for your free copy of "Gaskets, Packings, and Seals." Address Armstrong Cork Company, Gaskets and Packings Department, 7202 Arch Street, Lancaster, Pennsylvania.

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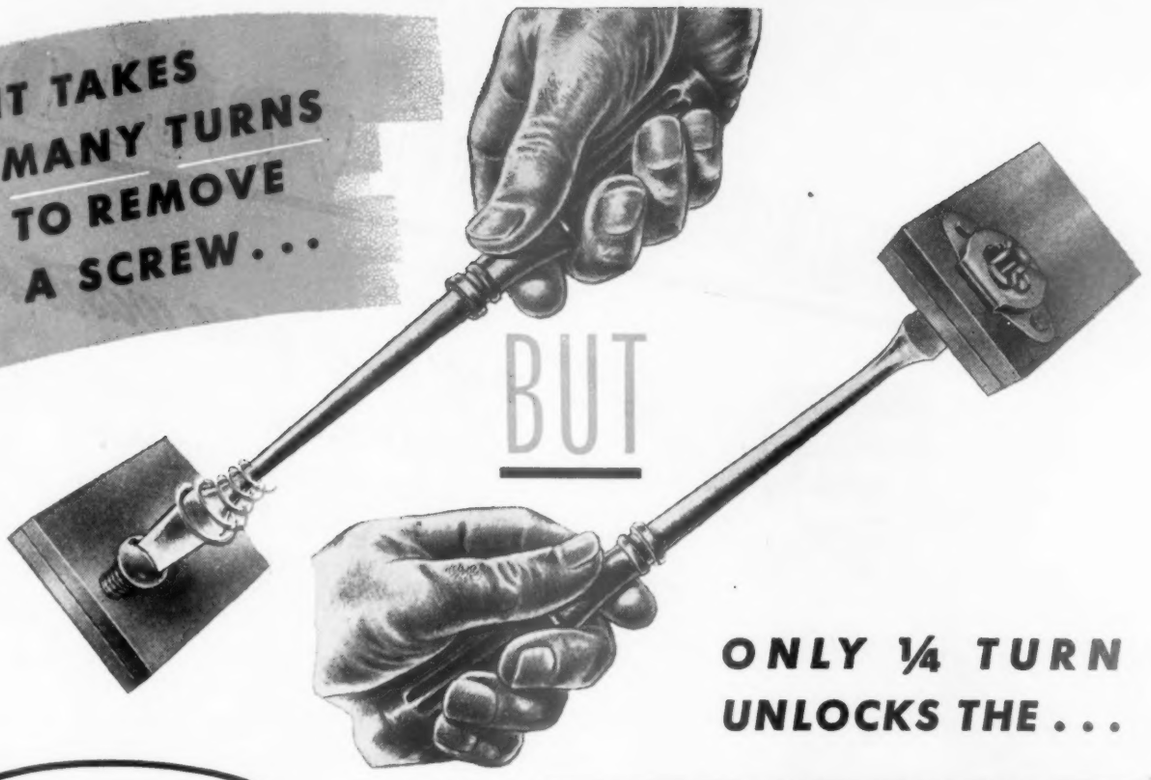
IT TAKES MANY TURNS TO REMOVE A SCREW . . .



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ONLY ¼ TURN UNLOCKS THE . . .

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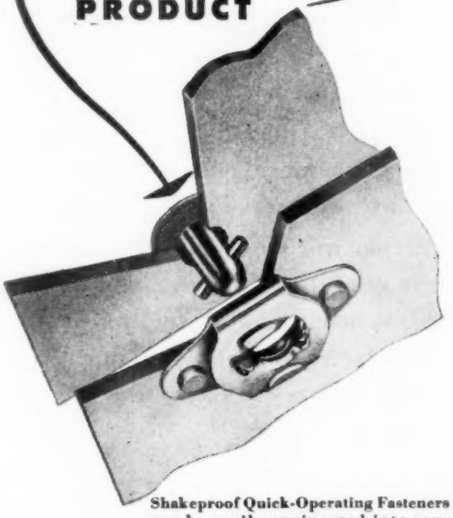

Shakeproof Quick-Operating Fasteners can be easily engineered into your product, and Shakeproof Engineers are ready to help you devise the best method for installation. Write now for this helpful service!

For fast opening and locking of all types of covers, doors and panels . . . use Shakeproof Quick-Operating Fasteners. Easy to install . . . easy to operate . . . locks tight! The entire unit is comprised of only 3 parts . . . spring unit, stud and cross pin. This fast servicing feature will definitely offer added utility to your product. Write now for new catalog —it gives complete data on sizes and suggested applications.

*Known in the Aviation industry as "Cowl" Fasteners.

FREE TEST KIT!

Contains a mounted, ready-to-operate sample plus various sized parts. Write for Kit No. 98.

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PURCHASING is an independent journal not the official organ of any association. It is the only publication of national scope devoted exclusively to the interests and problems of the purchasing executive in industry and government. Established 1915 as "The Purchasing Agent." Consolidated with "The Executive Purchaser."

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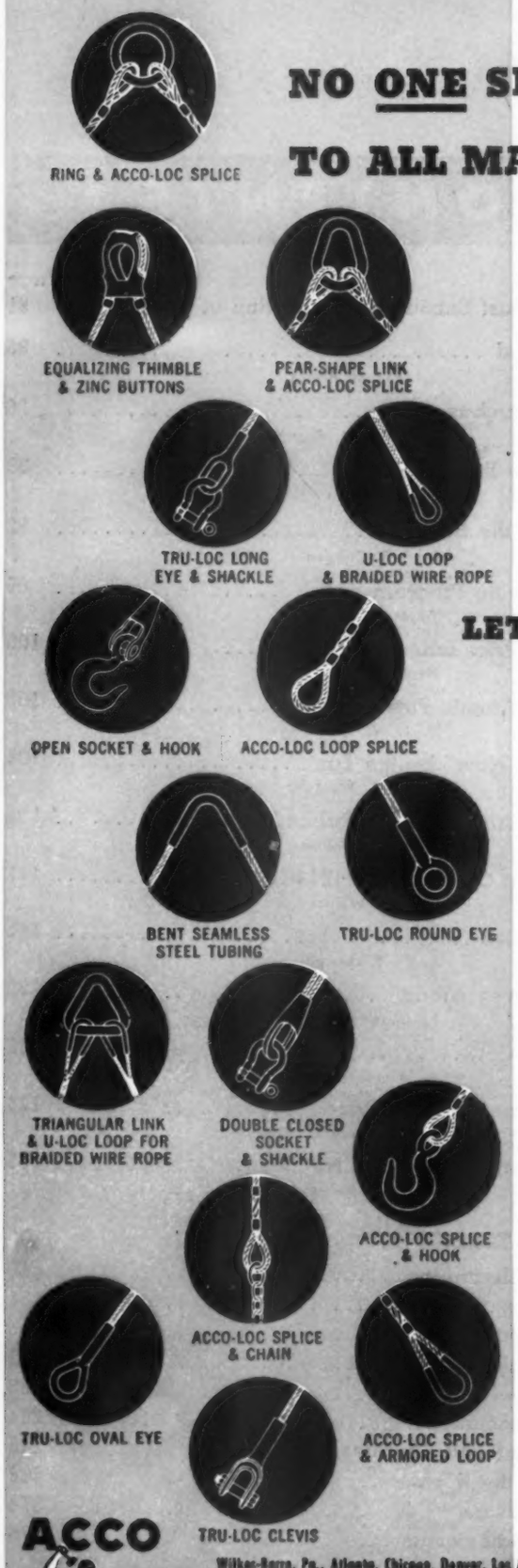
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One of the reasons is the anachronism of trying to balance 1946 costs against 1942 prices. Obviously this is a pincers movement, and we can expect to hear some screaming. Unfortunately, in too many cases, it is the cry of real distress. It is well established that this is true in respect to desperately needed building materials, and the same situation prevails in respect to radio and automobile parts, furniture, and scores of other production items that should be on the assembly lines today.

Living standards are not determined by pegged prices, but by the tangible goods that are available. The problem must be resolved at the production level. Without production there will be neither employment to provide income nor goods to satisfy demand.

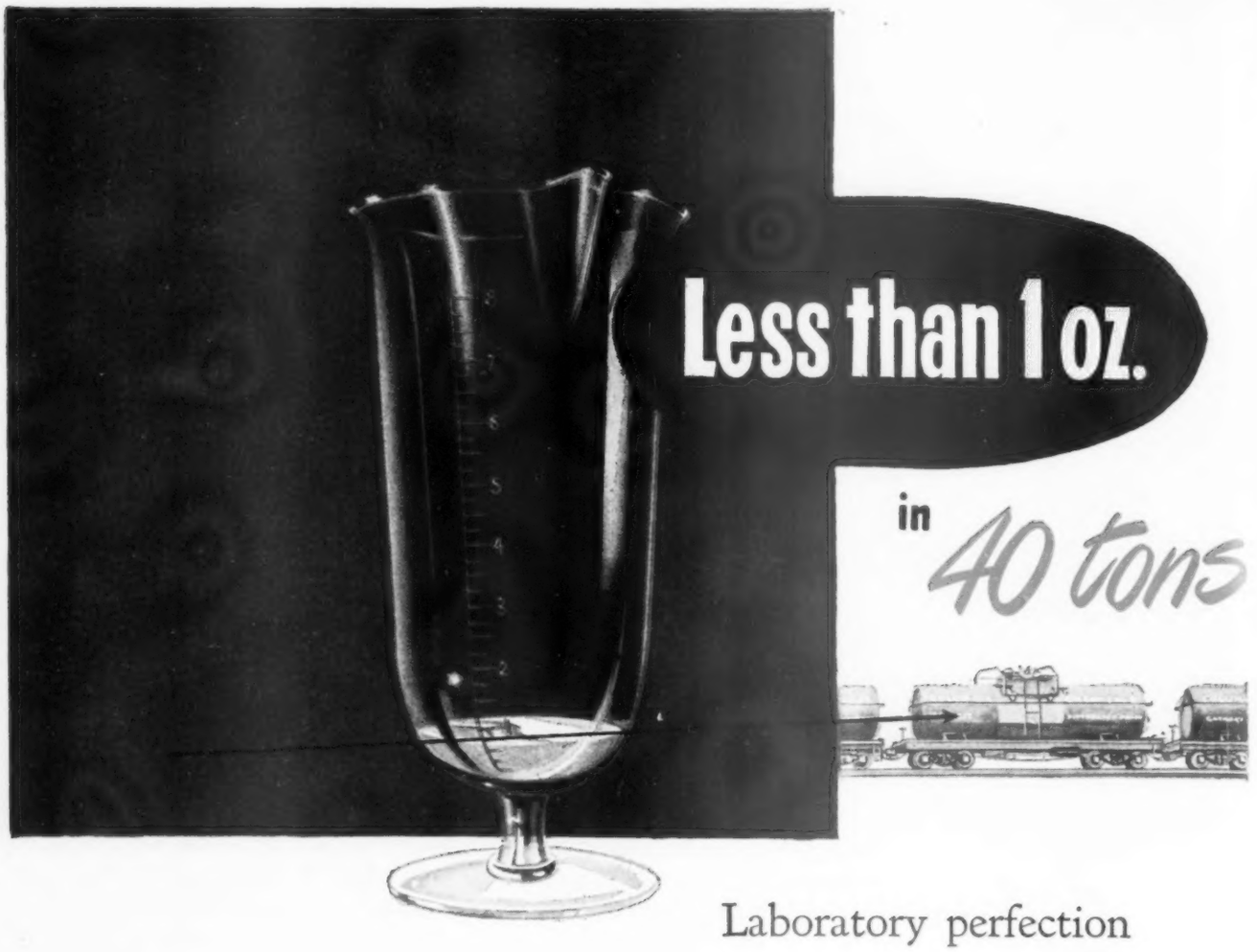
Industry wants to produce. It is uniquely concerned with price both as a buyer and as a seller. It seeks to support and strengthen its sources of supply by paying fair prices for what it buys. It favors wage rates adequate to serve as a fair reward and incentive for productive effort. It requires fair selling prices to provide a comparable reward and incentive on behalf of plant investment and enterprise. That is simple arithmetic. For business, unlike government, cannot exist and operate on deficit financing.

Some measure of price control will be useful in setting standards of value until a new and sound balance is achieved. But those standards must be flexible and realistic, geared to the variables of industry and to present costs. Price control destroys its own ends when it dams up the very source from which the substance of a better America and a better world must flow.

Don't underestimate the force of production as the most effective check on inflation. Don't disregard price as an incentive to production. Don't overlook competition as the spur to efficiency and the safeguard against excessive profits. Don't sell America short on the integrity and initiative of its business leadership.

Stuart F. Heinritz

(*Text of a radio address over the Columbia network, January 11, 1946, as part of an "Open Letter to President Truman on Reconversion Bottlenecks" from the Nation's business press, as represented by the National Conference of Business Paper Editors.)



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The manufacture of numerous products requires Caustic Soda of utmost "purity"—that is with its metallic content, such as copper or iron, rigidly controlled. In the production of high-strength textiles, for example, the presence of as much as one ounce of these impurities in 40 tons of caustic may result in an inferior product!

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The achievements in meeting exacting industrial standards—including the patented purification process for producing high grade diaphragm electrolytic Caustic Soda—are characteristic of Columbia operations. They are important reasons for entrusting your requirements for alkalies and related products to Columbia.

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HIGHLIGHTS

A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers

There's a college education in purchasing available in this issue for the buying man who takes his responsibility seriously and wants to do a scientific and workmanlike job of procurement. And the information is geared to the special problems of today's changing industrial scene.

How to determine the **Right Price** is the subject of a comprehensive story by F. G. Jenkins, appearing on page 124. It covers the basic factors of price analysis, sources of information, and methods of estimating such matters as machining time, quantity advantages, vendors' costing policies, and the like. With ceiling prices going out the window, and competitive bidding an unknown quantity, now is the time to put your prices to the test of a sound and searching analysis.

Supplementing this article is a study specially prepared for PURCHASING by one of the leading statistical and economic organizations of the country. Louis Weiner of the Bureau of Labor Statistics has traced for you the changing rations of **Labor Cost** and materials in representative industries. If you are still relying on the figures of ten years ago, your calculations may be in error. Mr. Weiner discusses the situation today and what we can expect in the period ahead. Turn to page 111.

Most purchasing agents follow commodity markets by reading one or more **Price Indices.** The article on page 100 will help you to interpret these statistics by understanding how they are compiled, what they tell, and what they do not tell; their significance as to historical data and as indicators of the future course of prices; why indices differ, and how they can be used as a purchasing guide.

John M. Brown's stimulating commentary on the practical relationship between sales and purchasing has been acclaimed as the most constructive recent contribution to this basic topic. In the guest editorial on page 85, he considers this relationship as a factor of the transition period and projects his thoughts to **The Road Ahead.**

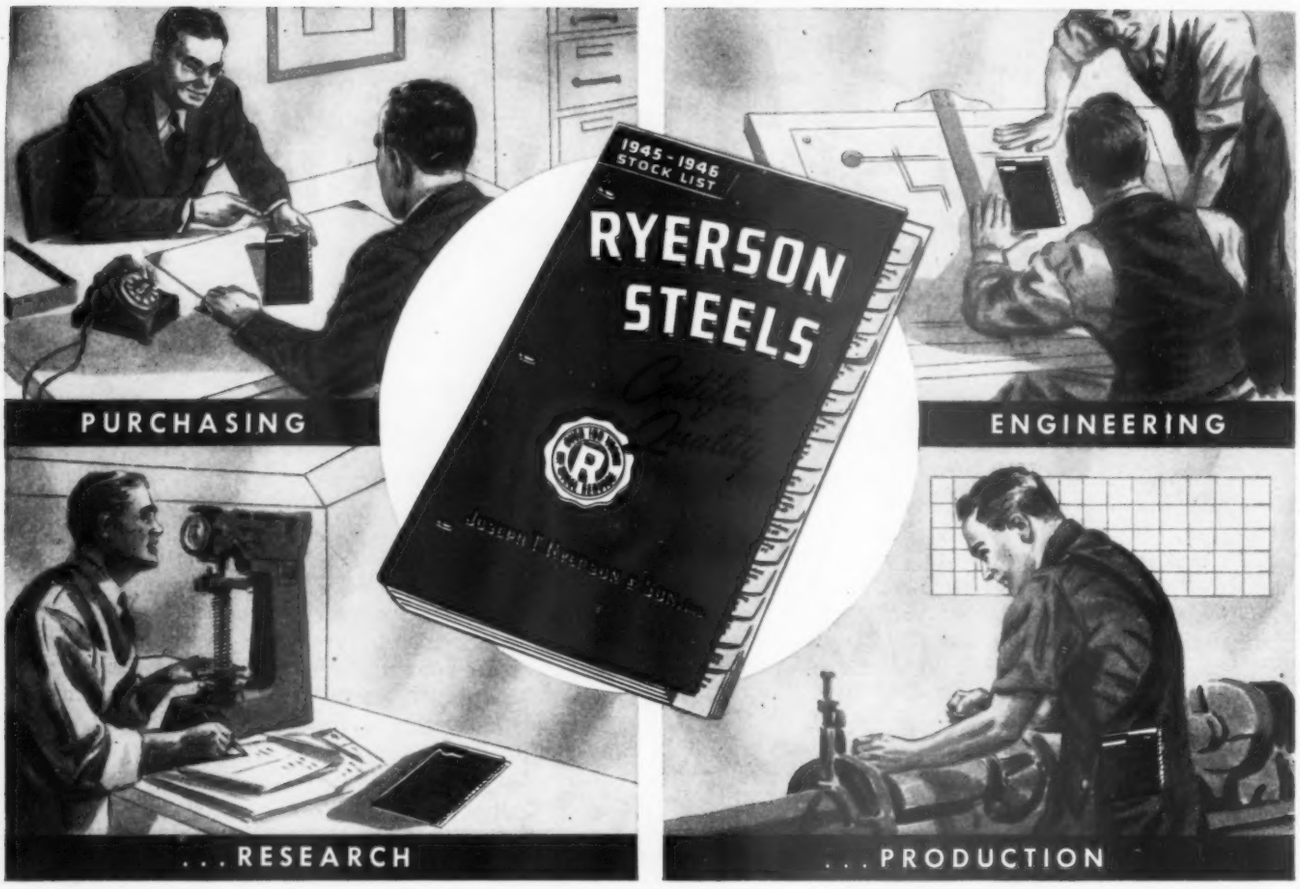
There's a complete **Purchasing System** outlined on page 92, showing how a minimum of key forms, well designed and routed to control points in the organization, help to accomplish the necessary functions of vendor selection, procurement, receiving, acceptance testing, and materials accounting. Also a case study of centralized purchasing as it serves the diverse requirements of the Cleveland Board of Education. You'll find this story on page 104.

Quality Control claims the serious attention of all purchasing men, for the right quality for a given purpose is the first consideration in buying and is the ultimate measure of value in a purchase. In a pair of timely and informative articles, appearing on pages 86 and 89, M. A. Brumbaugh discusses the underlying principles and R. V. Elms tells how a policy of cooperation between purchasing and inspection has helped solve the problem in a company where precision is of primary importance.

New Products and processes hold the key to our economic and industrial future. George Henry presents another article in his excellent series on **Plastics** (page 115); L. W. Chubb appraises the possibilities and limitations of **Atomic Power** (page 103); and our Washington editor tells how the technical developments of **German Scientists** are being made available to American industry (page 104).

In another of his reviews of modern **Business Law,** Leo T. Parker cites some recent court decisions involving questions of contingencies and notification. Lack of familiarity with these principles has been costly to many purchasing agents. To avoid their errors, turn to page 133.

Don't overlook these monthly departmental features compiled especially for purchasing men—the **Washington Letter** on page 65, with its timely and authoritative preview of official trends on matters affecting industry, as gathered by our Washington office; the listing of **Know-How Information,** that is yours for the asking, appearing on page 10; and the illustrated summary of **New Products and Ideas** that are now available for the industrial buyer (page 138), providing a quick and convenient means of keeping up to date on recent developments.



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THE ROAD AHEAD

Purchasing and sales must work together for efficient distribution in the period of intensive competition that is facing postwar industry

Let's act our age and do a better job

By JOHN M. BROWN,
Director of Purchases, Veeder-Root, Inc., Hartford, Conn.

MARKETING has entered a new era. The war is over; reconversion is the order for today; and competition is the apparition of tomorrow. Our radios and newspaper headlines fairly scream about the "big boom" ahead, and statisticians loudly proclaim astounding figures on the vast army of consumers begging to purchase our wares.

Before our eyes is flashed a beautiful, rosy picture of a marketing Utopia, and "drunk happy", we and our government still talk in billions, complacently forgetting that all is not gold that glitters. But don't let it blind us! Let us ask ourselves whether marketing has—and will—keep pace with these drastic changes. We have only looked at the one side. Like many other beautiful pictures, we are so apt to be carried away with its singular beauty that we become like a little child who dips a pipe into a soapy solution, blows gently into the stem, and sees a beautiful bubble appear with all the gorgeous colors of the spectrum. Spellbound, he watches it detach itself and float gracefully off into space. Suddenly it bursts and is no more. Disappointed and down-hearted, he tries again and again, but the same thing happens and his little mind cannot comprehend what is wrong.

So, too, may our beautiful picture become just another bubble unless we examine it closely and stand ready to repair its weaknesses. We are grown men, not children. With our experience, ability, and knowledge we must turn the canvas over and minutely inspect every part of it to find its weaknesses and faults, so that we will not be caught napping like the little child, in the spell of its beauty.

When we turn it over, we find it strangely different. We find here a picture of chaos: world unrest, strikes, displaced workers, lack of materials, lack of productive labor, government doles, and demobilization of millions of men seeking to return to a useful place in industry. In amazement we see 1939, with 55 to 56 million workers, and approximately 17% of them looking for jobs and production on a 40-hour-a-week basis. We see the frenzied war years, with plants operating on accelerated schedules, around the clock. We see 1946, with 64 to 65 million workers, and after this—a blank space.

Sobered by this second viewpoint,

Continued on page 362

Probably no other single business talk has had a more far reaching influence upon purchasing-sales relationships than Mr. Brown's address on "The Salesman Today as the Purchasing Agent Sees Him." Originally prepared for a local meeting of sales managers, it impressed his hearers so forcibly that he was immediately deluged with requests to repeat it before other groups, culminating in a Coast-to-Coast speaking tour last winter, sponsored by a national organization of sales executives and reaching audiences in more than seventy cities. In addition to these personal contacts, thousands have read the address in booklet form. Only recently, the topic was included on the program of an important marketing conference held at Ohio State University, with Mr. Brown as the speaker. This editorial contains the prefatory remarks on that occasion.

Mr. Brown commands a respectful hearing not only because of his personal standing and experience in the purchasing field, but because he is an exceptionally straight thinker and has the ability to see both sides of a question, to translate his experience into practical and constructive policies, and to deal frankly with controversial issues, hitting hard but with the saving grace of good nature. His theme is common sense, mutual understanding, and cooperation.

He is a past president of the Connecticut Purchasing Agents Association and a former vice president of the National Association.

Acceptability of deliveries from vendors depends not only on clear specification of what is wanted, but also on systematic inspection by known standards and methods

●

INSPECT YOUR PURCHASES

By MARTIN A. BRUMBAUGH
University of Buffalo
Editor, *Industrial Quality Control*

MANY Purchasing Agents have little interest in the quality of incoming material. They take the position that their job is to see to it that the requests of the operating departments for materials are executed, and that the invoices are checked against quantity arriving at the receiving dock. This article is designed to show that that concept of the Purchasing Agent's job never was correct, and particularly that Purchasing Agents who lived under that concept in the pre-war period are due for a sudden and rude awakening in the post-war period. Purchasing Agents must be thoroughly familiar with the methods employed in the receiving department and with the quality of incoming materials. They have an unequaled opportunity of taking the initiative in introducing efficiency in their receiving departments.

The Purchase Contract

Contracts might be classified in many different ways. Here interest centers in the quality requirement of the contract, which may be specified by a brand name, by a commercial standard, by an engineering pecification and blue print, or it ıay be unspecified. Regardless of vhich of the four methods is employed in a particular contract, the vendor is legally bound to supply material all units or parts of which comply with the specification.

With negligible exceptions, the purpose of the vendor is to meet the specification by shipping good quality merchandise. To this end he inspects faithfully and with the intention of removing all defectives before shipping. Yet defective material gets through. This may be due to failure of vendor's inspection, deterioration, misunderstandings of specifications, or other reasons. The fact is that the purchaser does not receive lots that are perfect, regardless of the reliability of the vendor. Therefore verification of the quality of incoming material is imperative.

To many Purchasing Agents this analysis and conclusion will be both obvious and elementary. Yet other concerns have no receiving inspection, and altogether too many Purchasing Agents consider that receiving inspection is not their concern unless they are plagued by excessive rejections. These Purchasing Agents are ostriches. They cannot ignore their receiving inspection departments. The Purchasing Agent is the party of the second part in a contract which contains a quality specification. The receiving department is responsible for verification of this quality specification. Consequently the Purchasing Agent must know what procedures are employed in verifying the specification.

But this is a defensive approach to a problem which calls for initiative from the purchasing department. There should be two specifications in a purchase contract:

1. Specification of the material.
2. Specification of evidence required in the receiving department that material meets first specification.

A large proportion of the disagreements between vendors and Purchasing Agents during the war was directly traceable to the absence from the contract of this second specification. Bundles of correspondence in purchasing files deal with disagreements on inspection results, inspection methods, types of inspection equipment, standards of smoothness, appearance, conformance to hardness or tensile requirements, etc.

The preparation of this second specification is not simple. At a glance, it may appear that the following would suffice: "All material will be inspected on arrival, and will be returned to vendor if found defective." A few examples will show that this statement is valueless.

1. Destructive tests—functioning tests of fuses or condensers, life tests of lamps, tubes or thermostats, tensile and bend tests.

2. Large lots—particularly material with low unit cost.

3. Concealed defects—castings and forgings.

4. Bulk material—rolls of cloth, cellophane, wire, paper, carpet, chemicals, flour.

In none of these cases is it practical to inspect 100%. Then the moot question arises, "When is a lot defective?" The whole thesis of this article is that the evidence required for acceptability should be stated in the contract.

The writing of this specification must be a cooperative enterprise of the purchasing department and the receiving inspection department. If purchasing is to take the initiative in this enterprise, the first obvious step is for purchasing to become better acquainted with receiving inspection operations. Some of the principles of receiving inspection are fairly well defined by experience.

Principles of Receiving Inspection

1. Avoid destructive testing wherever possible. The immediate purpose is to conserve material, but an additional factor is the time consumed in making destructive tests. In fact, life testing is shifted to the vendor wherever possible, in order to reduce delay in disposal of incoming lots. When destructive testing is necessary, tests of increased severity are employed to reduce sample sizes.

2. Fixed gauges are preferable to variable gauges. An inspector using "go-not-go" equipment can check a large number of pieces in a short time. If indicator gauges, comparators, or even micrometers must be used, the rate of inspection is comparatively slow. Further, many inspectors are not trained to read gauge scales accurately.

3. All gauges must be laboratory checked frequently to insure accuracy. Equipment which is bolted in place must be included in the checking program.

4. Standards should be established for all visual inspection. This is one of the difficult segments of receiving inspection. The only method that has been found effective in reducing inspector variability in judgment inspection is to keep approved standards immediately before the operator. In practice one of the difficulties has been to get engineering to accept two cases one of which is good enough to be acceptable and the other just bad enough to be rejectable.

5. Inspection of whole lots should be avoided whenever possible. This principle is not acceptable to the old line inspector who was trained to 100% inspection. Yet wartime conditions which will continue in the post-war period make 100% inspection undesirable because of the cost and the unreliability of the results. This principle applies to large lots rather than to lots of less than 200 pieces. The claim of unreliability is based on reinspection of large lots. On the average, inspectors are about 90% accurate when lots are so large that the fatigue element becomes important. This means that they miss about one faulty piece in ten and that about one piece in ten which they reject is acceptable. This refers to dimensions but not to visual inspection. Inspectors looking for the presence of a bleeder hole in a valve have sometimes missed as many defectives as they have found in a lot of 15,000.

6. Sampling is the keystone of receiving inspection. This means that all elements of the plant must understand that defective material will pass through receiving inspection into production and assembly. But the same is true with 100% inspection. Therefore the axiom is that some defective material will always be accepted. A well designed sampling plan will maintain better quality than 100% inspection and will do so at much lower cost.

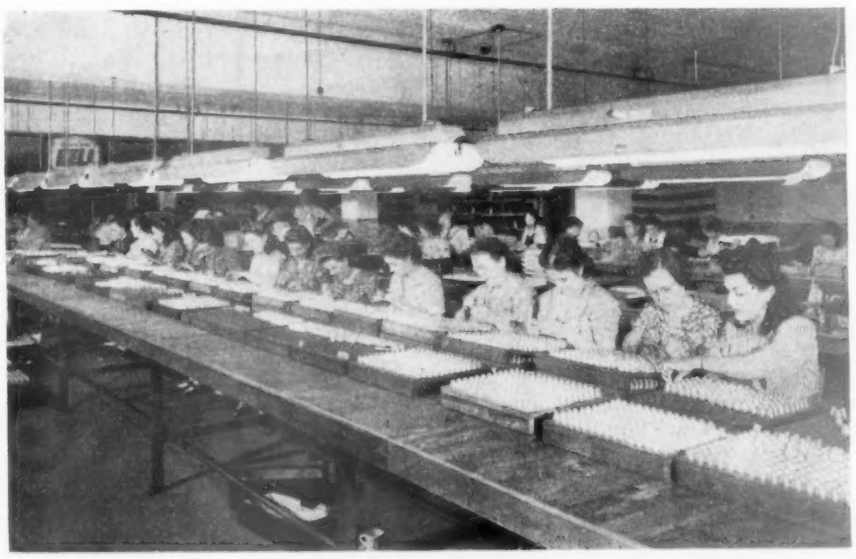
7. Modern sampling abandons fixed sample sizes as well as samples which are a fixed percentage of the lot. The principle is to maintain fixed quality protection. The object is to have the purchaser take a fixed small risk of accepting a poor quality lot, and to expose the vendor to a fixed small risk of having a good quality lot rejected.

8. Sample sizes are kept at the minimum consistent with the desired quality protection. This reduces inspection cost and largely eliminates inspector fatigue. One company receiving over 10,000,000 piece parts per month inspected only seven-tenths of one per cent of them but maintained quality at a level which speeded assembly operations, practically eliminated complaints of defectives in fabrication, and removed a receiving bottleneck. At the same time accurate quality reports to the purchasing department were used to clear up an accumulation of grievances of vendors.

9. Samples must be representative of the lots from which they are drawn. Inspectors must be carefully trained in acceptable methods of taking samples.

Purchasing and Inspection

The Purchasing Agent should understand the preceding set of principles not merely in general but as they are applied in his plant. He should know what inspection procedures are employed for particular incoming materials. This includes types of gauges, sampling plan, recording methods, and reporting forms. There are three well developed sampling plans available: The Army Ordnance Plan, the Dodge-Romig Plan, and the Sequential Plan. All of these provide the protection described previously. Some one in the purchasing department should be fairly familiar with the details of whichever one is used.



Quality control starts with inspection at the vendor's plant, but the buyer must supplement this with inspection of delivered merchandise

ADVANTAGES OF RECEIVING INSPECTION

Implements purchase specifications by assuring that deliveries comply with them.

Speeds acceptance with assurance that materials will be satisfactory to production departments.

Increases efficiency of production and assembly operations through reliance on known quality standards.

Avoids delay in making necessary adjustments on faulty deliveries.

Places dealings with vendors on a basis of fact rather than opinion and argument.

Aids in selection of vendors best equipped to furnish certain types of purchased parts and materials.

Aids in eliminating unsatisfactory sources of supply.

Completes the process of procurement and fixes responsibility for satisfactory deliveries.

Sometimes all three are used in a single plant, the one which is most economical being chosen for particular types of incoming products.

Knowledge of receiving inspection methods permits the purchasing department to deal with vendors on a much more factual basis than has sometimes been the case in the past. Specifically, purchasing can use inspection knowledge in the following ways.

Inspection can supply monthly tabulations of quality classified by individual part numbers and by individual vendors. This shows which parts a particular vendor does well and which he does poorly. It also shows which of several vendors does a particular part well and which do it poorly. During the war one purchasing department used this vendor rating tabulation to rearrange its contracts so as to put each vendor on the parts he could do best. The result was a marked improvement in quality of incoming material. In this rearrangement a few vendors who could not do well on any part were dropped.

By using objective and reliable inspection records the purchasing department can change conflicts with vendors from an emotional to a factual basis. When inspection can report the causes of rejection of a lot and can furnish examples of rejectable material to purchasing, there remains little area for disagreement concerning the quality of a lot. In such cases the disagreement is likely to turn on the question of gauge difference. But the Purchasing Agent who knows he is supported by regular checking of inspection gauges in a well equipped gauge laboratory is unlikely to lose an argument of this sort.

Knowledge of sampling methods employed in receiving inspection will enable the purchasing department to include in contracts usable specifications concerning the evidence which will be required that the material is acceptable. In some cases the vendor has agreed to use the purchaser's acceptance plan in final inspection before shipping. This opens the way for certification of the quality level of a shipment by the vendor, and permits the purchaser to reduce to pilot inspection, if the reliability of vendor's inspection has been previously established.

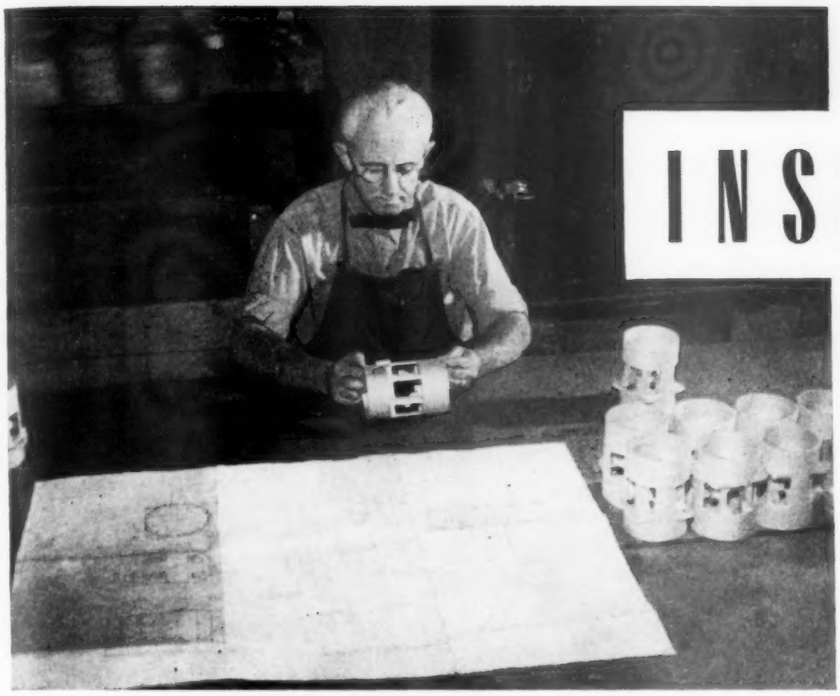
As a corollary to the preceding comes the question of when the vendor's responsibility for quality of material ceases. Some companies hold that vendors are permanently responsible for the quality of goods sold. At the other extreme are clauses in contracts which limit responsibility to 30 days. The question of responsibility probably should be related to the type of material. Standard materials which are individually unidentifiable after dumping into a bin, and which are purchased from several vendors, should have final quality determination at receiving inspection and vendor's responsibility should end there. Parts such as castings or forgings which may contain concealed defects that will prevent machining require a different concept of vendor responsibility.

In general, inflexible contract provisions concerning vendor responsibility are unwarranted, and Purchasing Agents should take the initiative in defining and classifying such responsibility. At least they should aim to avoid the embarrassment of one of their fellow buyers who returned to the vendor a shipment of bolts delivered some six months earlier. Subsequently he received a polite but pointed letter from the vendor reminding him that the vendor's plant produced only roll thread bolts, whereas the returned shipment was made on thread cutting machinery. The vendor readily agreed that the threads were defective.

Summary

Purchasing Agents should know more about activity in their receiving departments. Supervisors of receiving departments should know more about activities in their purchasing departments. Absence of cooperation in the past has been a major source of operating inefficiency. Out of this interchange of information should come an alteration of purchase specifications to include an acceptance clause that is workable in practice and equitable as between vendor and purchaser.

Finally, it will save time for everybody to explain that the author is in possession of the answer to all of the foregoing argument. It is "Buy from a reliable vendor and forget all of this hocus-pocus about receiving inspection, sampling, etc." This answer is nothing more than the defense of the incompetent who fear anything new or different. Concerning reliable vendors, ask this question, "Did your own company really ship defect free material which required no inspection, either before the war or during the war?" Few companies can answer in the affirmative, but even these know that the post-war era will be different. Engineering specifications will be more exact. Tolerances will be closer. Machines will hold dimensions better in spite of the use of more complicated tools, jigs and fixtures. Knowledge of purchased materials will be based on new production controls. The Purchasing Agent must be familiar with the new language. He must be prepared to take advantage of the assistance it offers to purchasing. This means that Purchasing Agents can not stand on their laurels. They must form a partnership with receiving inspection.



INSPECTION IS THE BUYER'S ALLY

Effective cooperation not only concerns the department heads; it must flourish all down the line as a specific policy

By R. V. ELMS, Purchasing Agent, Sperry Gyroscope Company, Brooklyn, N. Y.

THE Purchasing Agent's responsibility may be defined as "Obtaining the greatest value for his company's dollar with deliveries of material made on time". The latter burden must be carried by him alone, but the "best value" charge may be met only through co-operation with other departments of his company. In this, the Inspection Department may well be his finest aid.

Working Together

Cooperation is readily defined and generally well understood. In practice it is elusive. The heads of Purchasing and Inspection may have a thorough understanding of their mutual problem, they may agree on a plan of action, but it will fail unless all levels of personnel in their departments really work together. The Purchasing Agent and the Chief Inspector may really cooperate but all too often the men down the line are giving only "lip service". When such a condition exists, inspectors are looked upon as watchdogs ready to tear out the seat of an unsuspecting vendor's pants. Buyers are penny-pinchers whose vendors are chosen for the quality of cigars handed out by their salesmen.

A company can operate even when cooperation is colored with mutual distrust down the line. The Purchasing Agent obtains best value by relying on his specifications, the clauses in fine print on the back of his purchase order, and his ability to argue or bully his way out of a tight corner. The Chief Inspector performs his basic function and prevents inferior goods from getting into production. But nothing constructive is being done; only negative actions are taken by either party. The company does well enough, but misses many chances to do better.

The recent war created situations in many fields which could be met only by heroic measures. It forced Purchasing and Inspection Departments to take on large numbers of inexperienced men. Somewhat offsetting the inherent disadvantages of this influx of green help was the dilution of the traditional "Purchasing vs. Inspection" antipathy. Cooperation could be effectively sold down the line on both sides. When subcontracting by Sperry Gyroscope started to expand explosively, the need for our resident inspectors at the plants where parts were being made was accepted without much question. The buyer soon found the resident inspector to be his best source of "on-the-spot" information. The inspector found that he best served by constructive criticism of the vendor's work, abandoning his normal practice of speaking only when something was wrong. It was soon realized that the usual buyer-seller negotiations must be paralleled by the respective inspection departments. This war-learned lesson should present no peace-time reconversion problem.

When the required volume of

tools, jigs, and fixtures could not be purchased in Metropolitan New York, a tool buying office was set up in Detroit. In the early stages, inspection was by roving inspectors who were at the call of the Purchasing Department. When this was found to be time consuming, a central Purchasing-Inspection office was set up. All tools were delivered to this point and then reshipped to New York. Although this was done only to save time, an unexpected benefit arose by having the men of the two departments working together. Mere physical juxtaposition soon became genuine cooperation. Inspection pointed out to the buyers, the difference between mistakes and just plain incompetance on the part of the vendors; buying practices were modified accordingly and Sperry got the best value for its dollar.

Along with the above and other "highlights", a deliberate plan of Purchasing-Inspection-Vendor conferences was carried out. Frequently the most arbitrary and "ornery" Inspector proved to be right when the chips were down. It was only his apparent attitude which had run headlong into the buyer's stubborn protection of his vendor. Around a table they got to know each other a little better—and it is hard to carry a dislike for a man you know. Another method of resolving differences was to invite the vendor to be present at a "showdown" inspection. It was at such times that the buyer got a better slant on the Inspector's ability and the care which he took to protect not only the company's rights but to insure the greatest economy in production.

Organizing for Cooperation

Out of such instances has recently evolved an inspection plan which promises to do much to relieve the problems brought about when an inspector sticks strictly to his instructions to reject everything not 100% in accordance with specifications. Particularly in large companies the buyer cries that the inspector has no judgment, that he is too literal in his interpretation of the blueprint. (He forgets that tolerances are on the print expressing the designing engineer's judgment and that the inspector has no freedom of choice.) But fine as such a set-up appears on paper, it is too rigid. Salvage committees have proven rather unwieldy. A group of ten people around a table frequently can accomplish only one-tenth as much as one man can do alone.

Therefore, a former Chief Inspector of one plant has been appointed a sort of "Vendor's Helper". While he reports to the Inspection Department, he represents the best interests of the vendor, the buyer, production and engineering departments. He weeds out capricious rejections and when he does "pin one" on a supplier the buyer knows that the report is just and can be depended upon.

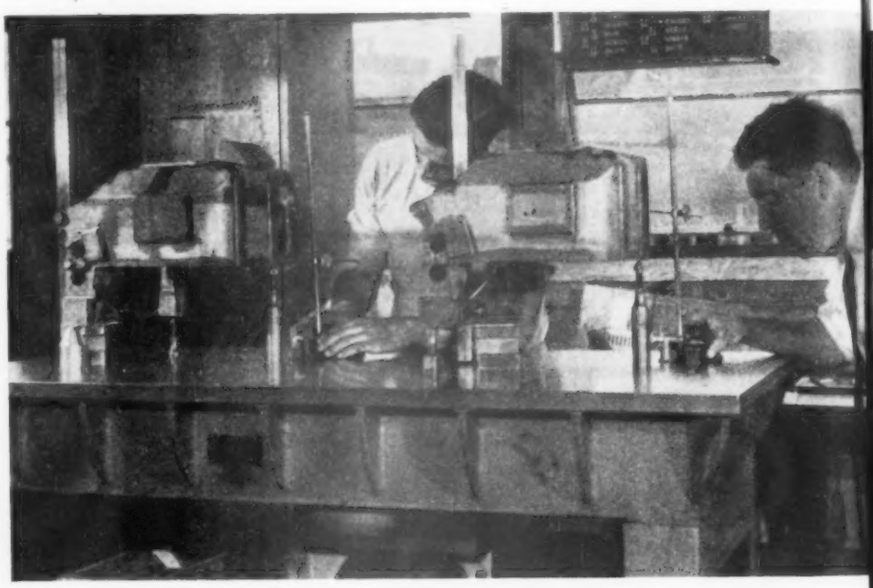
As a company gets larger and larger, especially during wartime, the paper work becomes voluminous to the point where it almost defeats its own purpose of quickly and accurately informing all interested parties of action which has been or should be taken. Sperry uses a Debit or D-Order to take care of the return of rejected material to a Vendor. It was formerly originated by Purchasing or Production Control following the inspector's report. Due to many causes, there were frequent delays between reports and the D-Order. This system was recently revised with Inspection initiating the D-Order and accepting responsibility for moving the material out of the plant immediately following the buyer's approval of such action. This has improved our relations with our vendors and gives the buyer a feeling that Inspection is doing something constructive about cooperation. Accurate, complete, and fast information between inspector and buyer is a sure trouble killer.

Whenever slightly off-standard material is accepted, there is a feeling all around that the vendor has been allowed to get away with something, and that his subsequent shipments may be even a little farther off. There is, of course, much justice in this. To eliminate this, Inspection sends to the buyer a report of "Acceptance of Substandard Material." This is passed on to the vendor. Continued receipt of such reports is sufficient warning to the buyer to drop this marginal supplier.

Mutual Confidence

In many discussions on procedures and actions to be taken, a Purchasing Agent's hackle may be seen to rise when something is suggested which might in some small way take away a part of his prerogative of sole control of that mythical thing called "Vendor Relations". It is undoubtedly wrong to accuse him of a "dog-in-the-manger" attitude, but this is unfortunately the impression which he sometimes creates. His subordinates are even more frequently accused of such action.

The P. A. must be the one man to represent his company to its suppliers, but this single-point control must not be throttled down too fine or it becomes a bottleneck. Although there were some early misgivings when Inspection was given rather free access to vendor, they are soon dispelled. If Purchasing is willing to accept without reservations the help offered by Inspection there is no loss of prestige or control. With



Inspection Comparison of Sample with Production

the valve wide open, information flows freely one way and good parts flow equally well the other way.

In a small company the introduction of new material or a new vendor is relatively simple. Samples are obtained and tried out or an introductory purchase order is placed. The item is put right into manufacture and the "Proof of the pudding is in the eating". When this same procedure is tried in a large organization the Inspector is the intermediary. Unless he approves, the sample never gets a trial.

Sample inspection sometimes is a nuisance and interferes with important production testing. The inspector may well feel that he is being imposed upon. Why try something new when what you already have is good enough? A call from the buyer or a memo explaining what may be gained if the sample is approved will start things off on the right foot. If the buyer starts by telling the salesman that he might buy if he "can get this past Inspection" he is doomed to failure. He is forgetting that Inspection also works for the same company as he does. He has missed the first step in co-operation—bringing the other man into his confidence.

The development of new sources is more than a one-department operation. In at least one large company the inspection "know-how" and point of view has been introduced into the purchasing department by assigning a chief inspector to work as Assistant to the Purchasing Agent. In all companies it might be well for the Chief Inspector and Purchasing Agent to consider themselves "Assistants to Each Other".

Sound Specifications

In every purchase order, specifications—either expressed or implied— are an integral part of the order. When buying for a large company or for precise instrument manufacture, they are likely to be stated in considerable detail. They are normally prepared by the Engineering Department and used by Purchasing to buy, and by Inspection to judge the quality of material supplied. They are sometimes a source of grief for all concerned. If such a condition exists it is time that a careful examination of the fundamentals of the problem be made by all parties concerned.

When it became apparent that Sperry's die casting specifications were in this category, Purchasing and Inspection undertook a program of revision. Instead of flatly demanding practical specs, Purchasing collected examples in use by other companies and by the diecasters themselves. Inspection then took the lead and, within the scope of commercial practice, drew up a set which were acceptable to Engineering. By cooperation, with each department moving out of its traditional position, the specifications now permit the engineer to express much more clearly to the diecaster his complete quality requirements. Having started right, buying is easier and a steadier flow of usable castings to production is assured.

No article such as this should attempt to lay down a fixed plan for others to follow. What will work in one company will fail to accomplish the desired results in another. The most that can be done is to offer a basic thought, and by citing some examples of successful application, to stir imagination on the part of others to take action in a similar vein. Cooperation starts with proper thinking, but doesn't get far without associated action. The slightest feeling that "like the poor, Inspection is always with us" will kill it. Cooperation must start at the top but will come to nothing unless it flourishes all the way down the line.

Purchasing is well out of the shirt-sleeve, suspenders, and cuspidor stage. It has asserted its independence and carried its burdens with increasing skill. It has made tremendous strides, especially during the war. Management has recognized its achievements, but it must consolidate its position while keeping pace with reconversion problems. A well planned, agressively executed program of cooperation with Inspection should be mutually beneficial. During the war the cry was for "more and more". During reconversion and peace the cry must change to "more, and more economically". Making a staunch ally of Inspection is a good step in that direction.

Inspection for Surface Condition

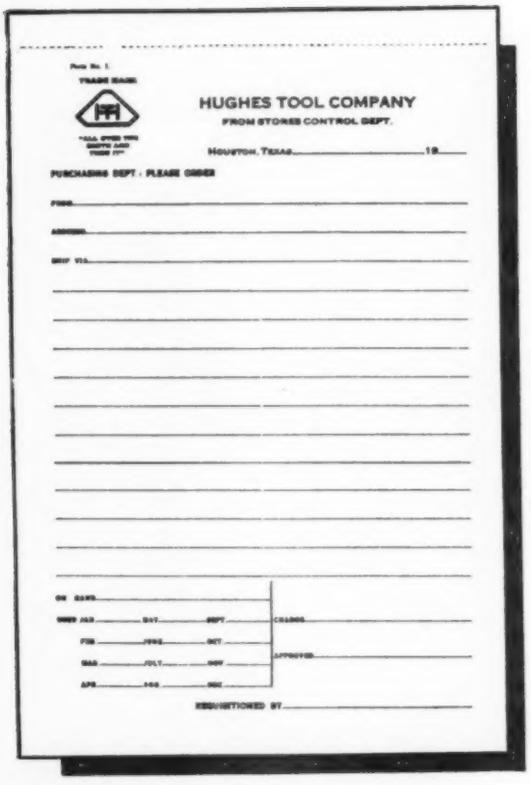
Vendor-Buyer-Inspector Conference

THE FORMS TELL THE STORY • • •

Simple system covers all controls and records for purchasing, inspection, rejections and materials accounting

By E. R. COBDEN

Purchasing Agent
Hughes Tool Company
Houston, Texas



HUGHES TOOL COMPANY
FROM STORES CONTROL DEPT.

Houston, Texas ..... 19....

PURCHASING DEPT.: PLEASE ORDER

FROM.....

ADDRESS.....

SHIP VIA.....

ON HAND.....

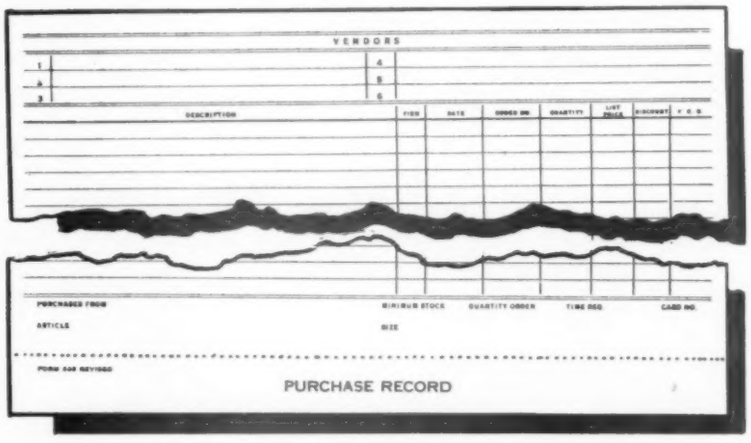
WHEN REQ'D ..... DAY ..... DEPT. .....

FOR ..... YEAR ..... ACCT. .....

REQUISITIONED BY.....

COSTING.....

APPROVED.....



VENDORS

1		4	
2		5	
3		6	

DESCRIPTION | FIRM | DATE | ORDER NO. | QUANTITY | LIST PRICE | DISCOUNT | F. O. B.

PURCHASED FROM ..... MINIMUM STOCK ..... QUANTITY ORDER ..... TIME REQ. ..... CARD NO. .....

ARTICLE ..... SIZE .....

FORM 608 REVISED

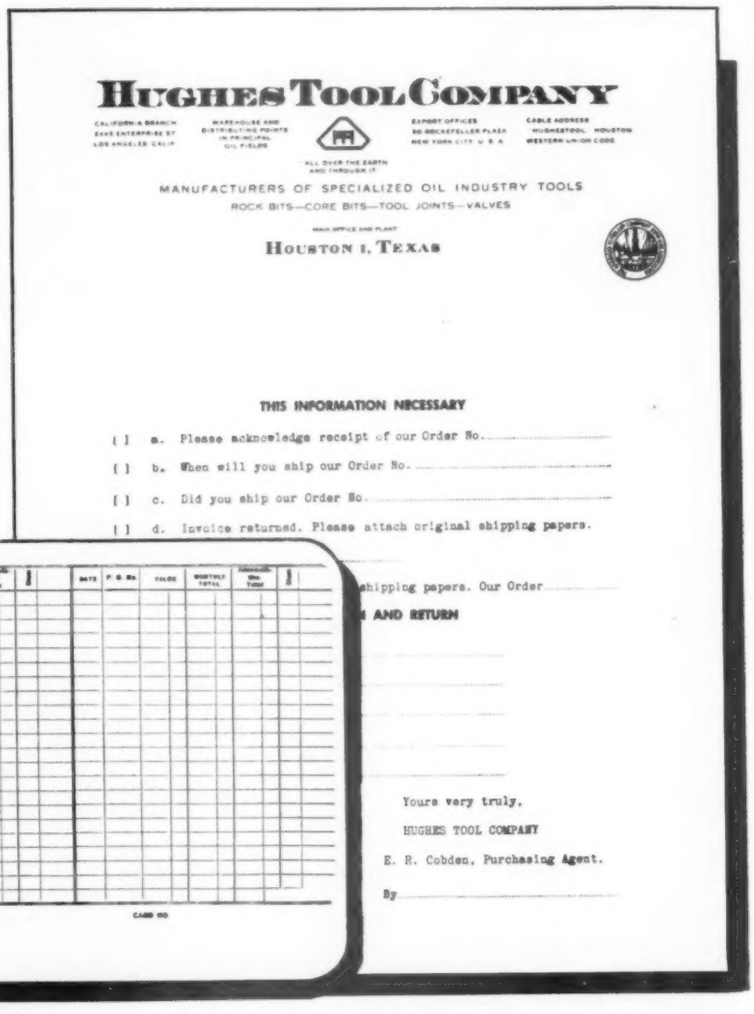
PURCHASE RECORD

Purchase originates with requisition, shown above.

Vendor is selected from Purchase Record card (upper right) filed alphabetically by commodities.

A cumulative record is kept of business placed with each supplier (below).

Ordinary follow-up is handled by form letter, shown at right.



HUGHES TOOL COMPANY

CALIFORNIA BRANCH ... WAREHOUSE AND DISTRIBUTING POINTS IN PRINCIPAL OIL FIELDS ... EXPORT OFFICES ... CABLE ADDRESS ...

ALL OVER THE EARTH AND THROUGH IT

MANUFACTURERS OF SPECIALIZED OIL INDUSTRY TOOLS

ROCK BITS—CORE BITS—TOOL JOINTS—VALVES

MAIN OFFICE AND PLANT

HOUSTON 1, TEXAS

THIS INFORMATION NECESSARY

[ ] a. Please acknowledge receipt of our Order No.....

[ ] b. When will you ship our Order No.....

[ ] c. Did you ship our Order No.....

[ ] d. Invoice returned. Please attach original shipping papers.

.....shipping papers. Our Order.....

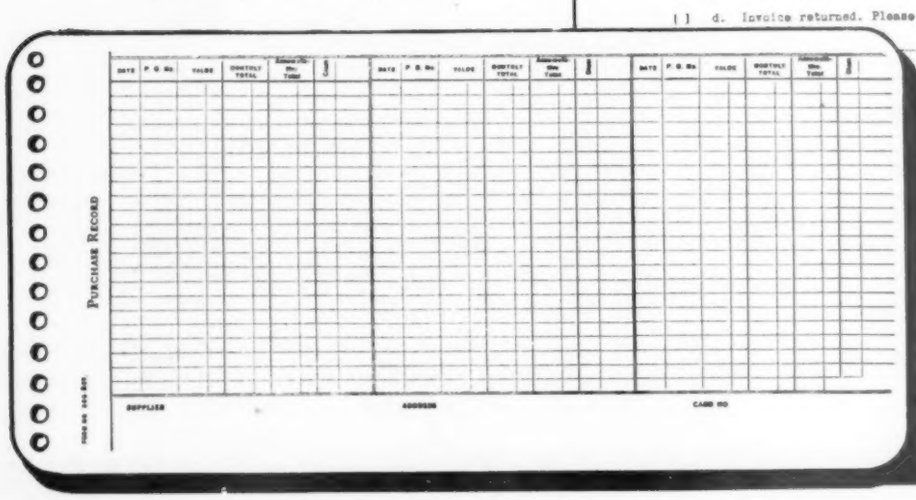
.....AND RETURN

Yours very truly,

HUGHES TOOL COMPANY

E. R. Cobden, Purchasing Agent.

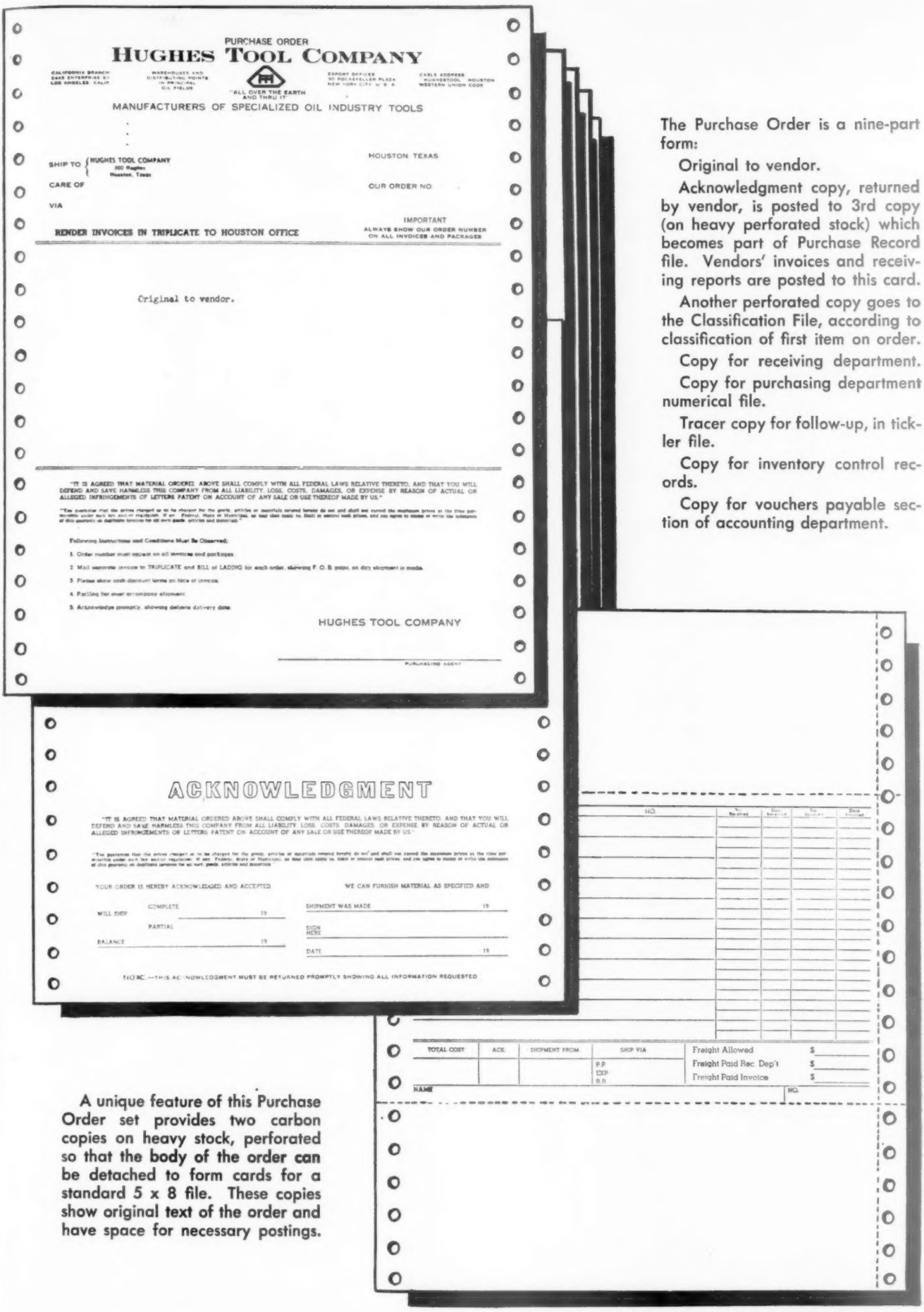
By.....



PURCHASE RECORD

DATE | P. O. No. | TO/OE | DOCTOLT TOTAL | Amount On This Order | ✓ | DATE | P. O. No. | TO/OE | DOCTOLT TOTAL | Amount On This Order | ✓ | DATE | P. O. No. | TO/OE | DOCTOLT TOTAL | Amount On This Order | ✓

SUPPLIER ..... ADDRESS ..... CARD NO.


PURCHASE ORDER
HUGHES TOOL COMPANY
"ALL OVER THE EARTH AND THRU IT"
MANUFACTURERS OF SPECIALIZED OIL INDUSTRY TOOLS
SHIP TO
HUGHES TOOL COMPANY
200 Hughes
Houston, Texas
HOUSTON, TEXAS
CARE OF
OUR ORDER NO.
VIA
RENDER INVOICES IN TRIPLICATE TO HOUSTON OFFICE
IMPORTANT
ALWAYS SHOW OUR ORDER NUMBER ON ALL INVOICES AND PACKAGES
Original to vendor.
"IT IS AGREED THAT MATERIAL ORDERED ABOVE SHALL COMPLY WITH ALL FEDERAL LAWS RELATIVE THERETO; AND THAT YOU WILL DEFEND AND SAVE HARMLESS THIS COMPANY FROM ALL LIABILITY, LOSS, COSTS, DAMAGES, OR EXPENSE BY REASON OF ACTUAL OR ALLEGED INFRINGEMENTS OF LETTERS PATENT ON ACCOUNT OF ANY SALE OR USE THEREOF MADE BY US."
Following Instructions and Conditions Must Be Observed:
1. Order number must appear on all invoices and packages.
2. Mail separate invoice in TRIPLICATE and BILL of LADING for each order, showing F. O. B. point, on day shipment is made.
3. Please show cash discount terms on face of invoice.
4. Packing list must accompany shipment.
5. Acknowledge promptly, showing definite delivery date.
HUGHES TOOL COMPANY
PURCHASING AGENT
ACKNOWLEDGMENT
"IT IS AGREED THAT MATERIAL ORDERED ABOVE SHALL COMPLY WITH ALL FEDERAL LAWS RELATIVE THERETO; AND THAT YOU WILL DEFEND AND SAVE HARMLESS THIS COMPANY FROM ALL LIABILITY, LOSS, COSTS, DAMAGES, OR EXPENSE BY REASON OF ACTUAL OR ALLEGED INFRINGEMENTS OF LETTERS PATENT ON ACCOUNT OF ANY SALE OR USE THEREOF MADE BY US."
YOUR ORDER IS HEREBY ACKNOWLEDGED AND ACCEPTED
WE CAN FURNISH MATERIAL AS SPECIFIED AND
WILL SHIP COMPLETE 19
PARTIAL
BALANCE 19
SHIPMENT WAS MADE 19
SIGN HERE
DATE 19
NOTE.—THIS ACKNOWLEDGMENT MUST BE RETURNED PROMPTLY SHOWING ALL INFORMATION REQUESTED
NO.
TOTAL COST
ACK.
SHIPMENT FROM
SHIP VIA
P.P.
EXP.
R.R.
Freight Allowed $
Freight Paid Rec. Dep't $
Freight Paid Invoice $
NAME
NO.

The Purchase Order is a nine-part form:

Original to vendor.

Acknowledgment copy, returned by vendor, is posted to 3rd copy (on heavy perforated stock) which becomes part of Purchase Record file. Vendors' invoices and receiving reports are posted to this card.

Another perforated copy goes to the Classification File, according to classification of first item on order.

Copy for receiving department.

Copy for purchasing department numerical file.

Tracer copy for follow-up, in tickler file.

Copy for inventory control records.

Copy for vouchers payable section of accounting department.

A unique feature of this Purchase Order set provides two carbon copies on heavy stock, perforated so that the body of the order can be detached to form cards for a standard 5 x 8 file. These copies show original text of the order and have space for necessary postings.

1—ACCOUNTING DEPT

REPORT OF RECEIPT OF
STOCK ON ORDER NO.

FROM

VIA INCOMING CHGS

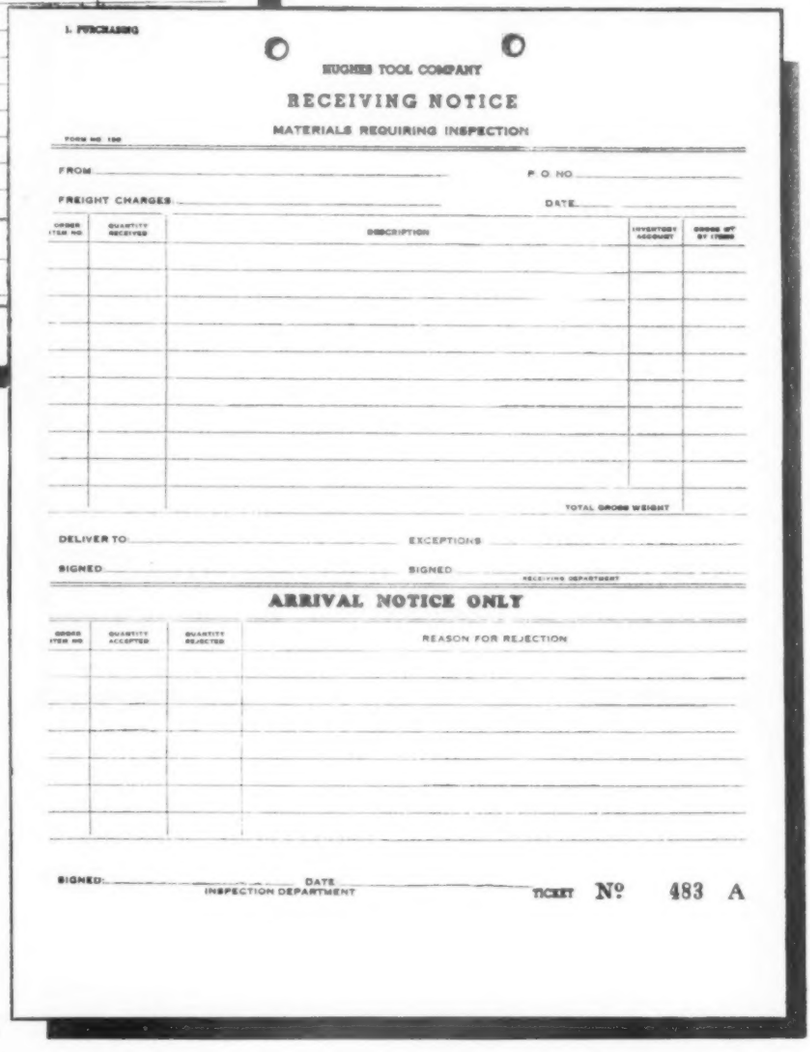
FOR

DEPARTMENT

REPAIR DEPT MANAGER

FORM NO. 1660

Material not subject to inspection is written into stock on a six-part snapout receiving notice (left). One copy is retained by receiving department. Other copies for: accounting, purchasing (posted to purchase record), material control, stores (signed and returned to receiving), and department for which purchase was made.



1. PURCHASING

HUGHES TOOL COMPANY

RECEIVING NOTICE

MATERIALS REQUIRING INSPECTION

FORM NO. 190

FROM P. O. NO.

FREIGHT CHARGES DATE

ORDER ITEM NO.	QUANTITY RECEIVED	DESCRIPTION	INVENTORY ACCOUNT	GROSS WT. BY ITEMS

TOTAL GROSS WEIGHT

DELIVER TO EXCEPTIONS

SIGNED SIGNED
RECEIVING DEPARTMENT

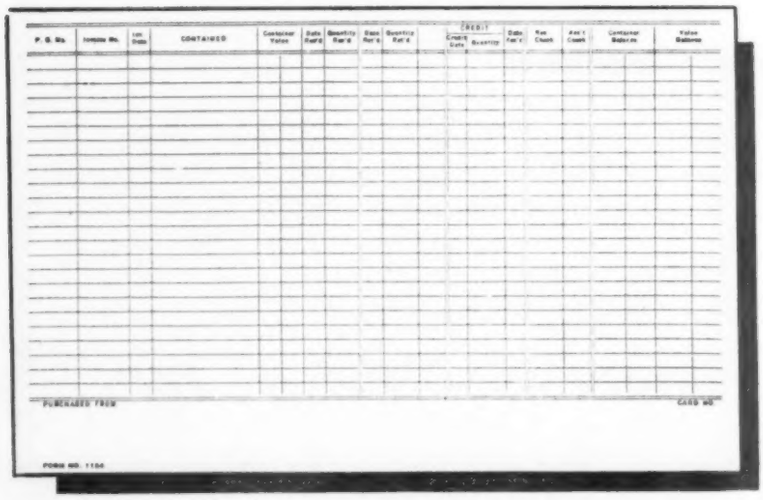
ARRIVAL NOTICE ONLY

ORDER ITEM NO.	QUANTITY ACCEPTED	QUANTITY REJECTED	REASON FOR REJECTION

SIGNED: DATE
INSPECTION DEPARTMENT

TICKET Nº 483 A

Materials requiring inspection are reported on the eight-part "long form" receiving notice (right). Original is released to purchasing immediately as arrival notice and one copy is retained by receiving. Other copies are sent with material to inspection department. After accepting or rejecting material, action is noted on form and copies are distributed to inspection, accounting, purchasing, material control (or tool control), stores, and department for which material is ordered.



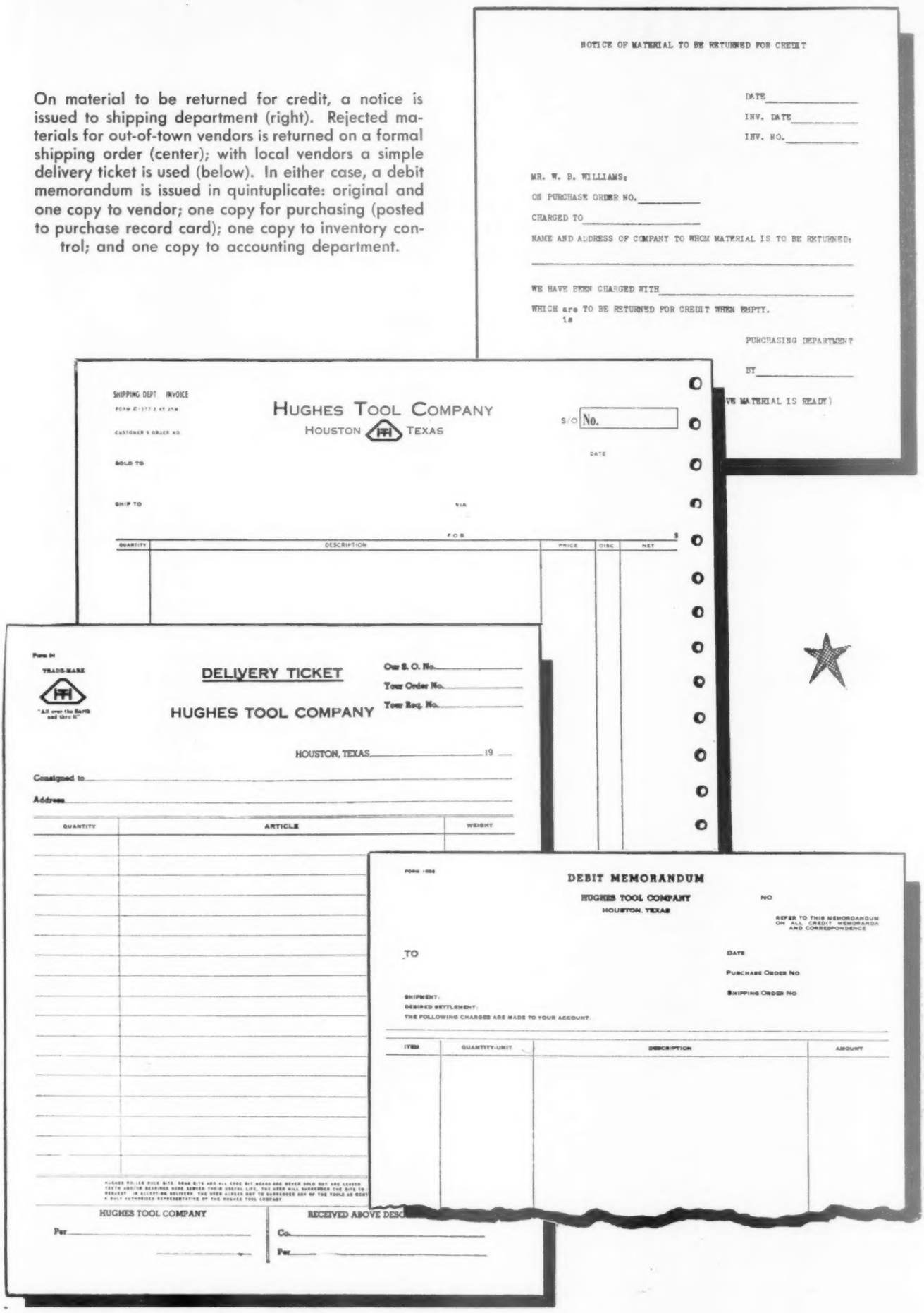
P. O. No.	Invoice No.	Inv. Date	CONTAINED	Container Value	Date Rec'd	Quantity Rec'd	Date Ret'd	Quantity Ret'd	CREDIT Credit Date	CREDIT Quantity	Date Ret'd	Rec. Check	Acc't Credit	Container Balance	Value Balance

PURCHASED FROM CARD NO.

FORM NO. 1154

An accurate record is kept of all returnable containers and their disposition. This is filed according to vendor's name.

On material to be returned for credit, a notice is issued to shipping department (right). Rejected materials for out-of-town vendors is returned on a formal shipping order (center); with local vendors a simple delivery ticket is used (below). In either case, a debit memorandum is issued in quintuplicate: original and one copy to vendor; one copy for purchasing (posted to purchase record card); one copy to inventory control; and one copy to accounting department.



NOTICE OF MATERIAL TO BE RETURNED FOR CREDIT

DATE_____
INV. DATE_____
INV. NO._____

MR. W. B. WILLIAMS:
ON PURCHASE ORDER NO._____
CHARGED TO_____
NAME AND ADDRESS OF COMPANY TO WHOM MATERIAL IS TO BE RETURNED:

WE HAVE BEEN CHARGED WITH_____
WHICH are TO BE RETURNED FOR CREDIT WHEN EMPTY.
is

PURCHASING DEPARTMENT
BY_____
VE MATERIAL IS READY)

SHIPPING DEPT. INVOICE
CUSTOMER'S ORDER NO.
SOLD TO
SHIP TO
HUGHES TOOL COMPANY
HOUSTON TEXAS
S/O No.
DATE
VIA
F.O.B.
QUANTITY | DESCRIPTION | PRICE | DISC. | NET

Form 54
TRADE-MARK
"All over the Earth and then it"
DELIVERY TICKET
HUGHES TOOL COMPANY
Our S. O. No.
Your Order No.
Your Req. No.
HOUSTON, TEXAS, 19
Consigned to
Address
QUANTITY | ARTICLE | WEIGHT
HUGHES TOOL COMPANY
Per
RECEIVED ABOVE DESC
Co.
Per

DEBIT MEMORANDUM
HUGHES TOOL COMPANY
HOUSTON, TEXAS
NO
REFER TO THIS MEMORANDUM ON ALL CREDIT MEMORANDA AND CORRESPONDENCE
TO
DATE
PURCHASE ORDER NO
SHIPPING ORDER NO
SHIPMENT:
DESIRED SETTLEMENT:
THE FOLLOWING CHARGES ARE MADE TO YOUR ACCOUNT:
ITEM | QUANTITY-UNIT | DESCRIPTION | AMOUNT

A SEASONAL BUYING PROGRAM

The Northwest salmon packing industry must schedule its activities according to the spawning and fishing season and for operations far from supply bases, posing specialized procurement problems

By M. G. HAWKINS

PURCHASING for the salmon packing companies of the Pacific Northwest might be classified as a routine business occupation. Certainly a typical example from this field presents a picture of stark simplicity so far as forms and procedures are concerned. Yet, in addition to being regulated and restricted by the laws out of Washington, D. C., and by the whims and habits of five different species of fish, it has some specialized aspects that are distinctly interesting and significant in purchasing practice.

Although it operates only about six months out of every year, the Pacific Northwest salmon packing industry is a billion dollar annual business. It involves a total of about ninety different concerns, and takes in a territory of more than 1,440,000 square miles—ranging from Seattle, Washington, northward to Alaska and the Aleutians.

It differs from the ordinary manufacturing business in that it requires more than efficient plant operation, though that is an important factor. Each packer must have and maintain his own fishing fleet to draw the "raw material" of the industry out of the seas, and sometimes it is even necessary to establish small villages in areas where the fish are most abundant, and the list of purchased supplies consequently embraces the whole scope of community life and its manifold requirements.

The basic laws governing the situation are comparatively simple. They require fishing in specified waters at given seasons of the year, and make it necessary for the fishermen to allow half of each catch to escape in order to conserve the supply of salmon. But sometimes the fish aren't as cooperative as they might be.

Each species of salmon has a special fresh-water spawning season. The young fish are hatched in about six weeks, but they may remain in fresh water for as long as two years before they head seaward. At sea, they grow rapidly, but they may not attain their maximum size for as many as five years. Then they return to their spawning grounds to lay their eggs and die.

Salmon fishing must take place either just before or just after the various schools return to fresh water, and for this reason it is necessary to keep case histories of virtually all the salmon that are spawned in order to determine approximately when and where they will be available for canning. Of course, the records are not always completely accurate, but if they are meticulously kept they generally make it possible to have an adequate number of boats, nets, and fishermen on hand at the right places during each fishing season.

Because bad guesses and cut-throat competition could soon ruin the entire industry, the ninety packers pool their information and resources in order to make sure that each will obtain a capacity quota of fish. But when the time comes to put those fish into cans, it is a different story. Each packer endeavors to obtain the best layout of machinery and equipment to handle his product and put it on the market with minimum losses in time and spoilage, and at the lowest possible cost. It is highly competitive in this phase.

Many of the packers have conveyor systems that might create envy among automotive manufacturers. These conveyors take the fish directly from the dock, accomplish all necessary sorting, clean and wash each individual specimen, and carry out the entire canning process, assisted only by a handful of well trained inspectors and mechanics.

All of this means that the purchasing agent for each packing company must:

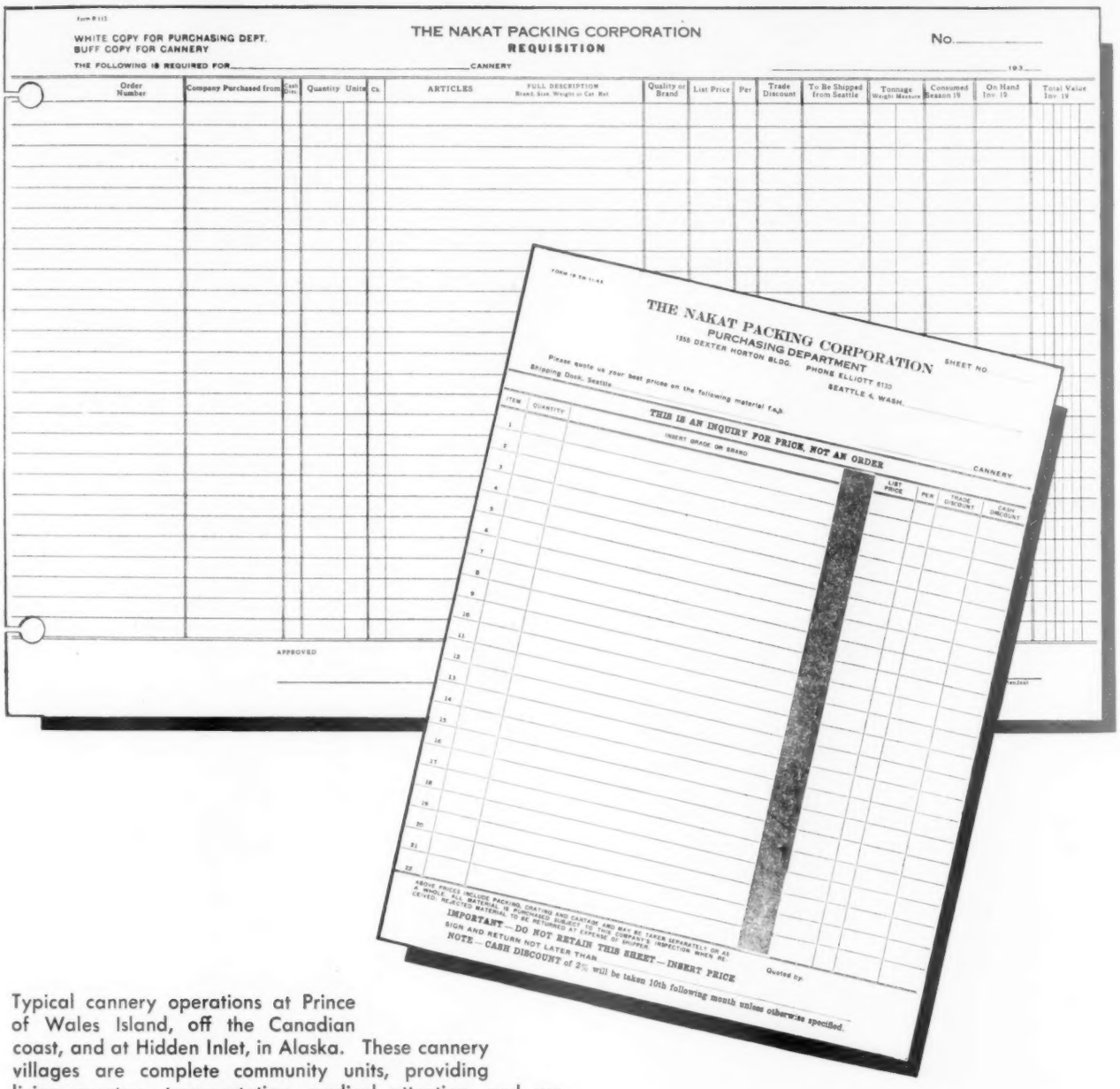
(1) Obtain careful estimates regarding the boats, nets, and other supplies that will be required for each fishing expedition. It is too late to revise lists and quantities after the boats have sailed.

(2) Make certain that these boats, nets, and supplies will be on hand at the right place and at the right time, regardless of whether the salmon return to their spawning grounds a few days early or a few days late. These schedules, and the procurement to implement the work, cannot be adjusted.

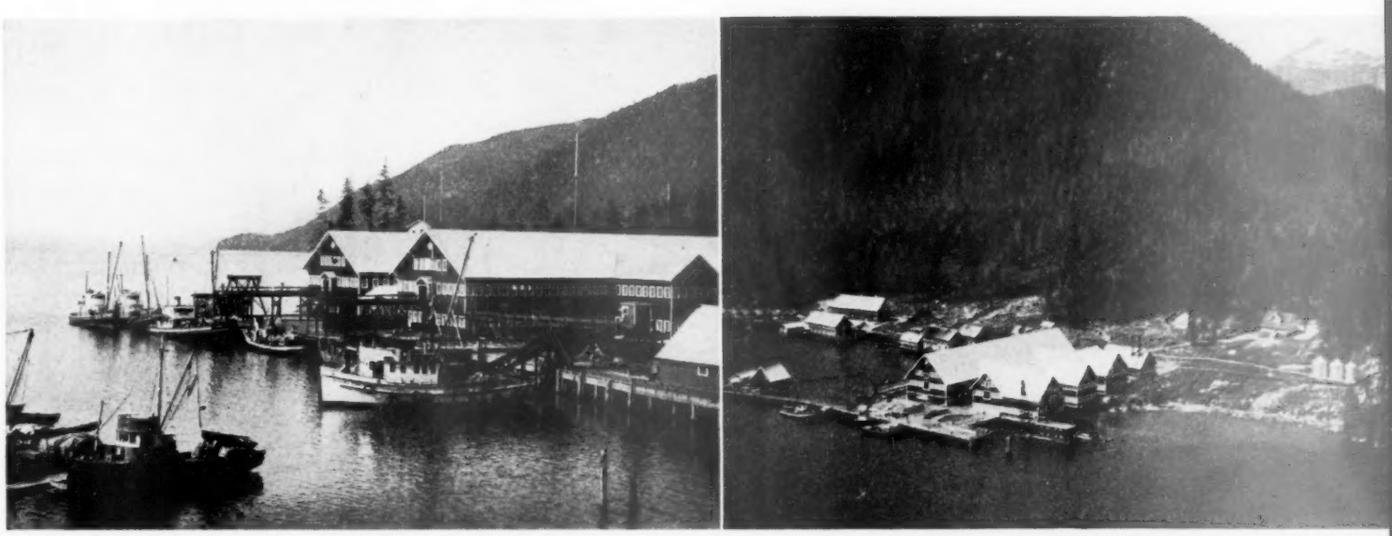
(3) Keep his company up to date with the most efficient canning equipment it can afford, and maintained in top condition.

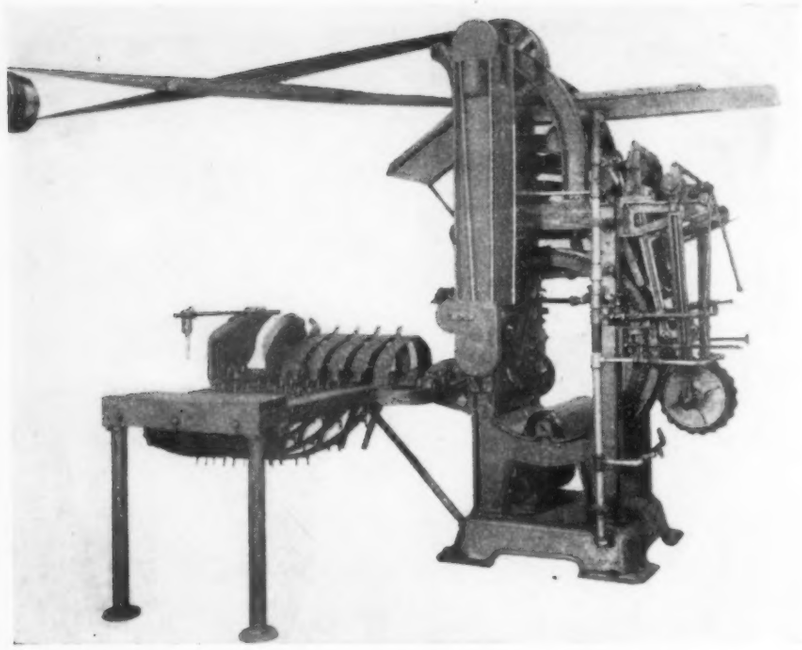
(4) Have a means of disposing of surpluses at the close of each season.

Typical of factories that have managed to solve this big buying problem with both economy and efficiency is The Nakat Packing Corporation, affiliated with the Great Atlantic and Pacific Tea Company of Seattle. According to C. B. Piercy, Nakat purchasing agent, the primary secret of success is an elaborate "shopping list", officially known as the Requisition Index.



Typical cannery operations at Prince of Wales Island, off the Canadian coast, and at Hidden Inlet, in Alaska. These cannery villages are complete community units, providing living quarters, transportation, medical attention, and recreational facilities for cannery workers and fishermen.





Cannery equipment is highly specialized. This is the "Iron Chink" produced by Smith Cannery Machines Co., Seattle. It cleans and cuts 60 fish per minute, a job that formerly required the services of 50 men.

The Requisition Index is a list of some 2,000 items, including virtually everything that has been or could be used in the process of catching and canning fish, and all of the supplementary activities incident to this business. Alphabetically, it ranges from absorbent cotton to zinc sheets. It includes, in addition to the industrial, maintenance and marine items one would expect to find there, a wide variety of fresh and canned foods, medical supplies, clothing, baseballs, collar buttons, playing cards, cigarettes, dishes, necklaces, shoe laces, and plumbing fixtures.

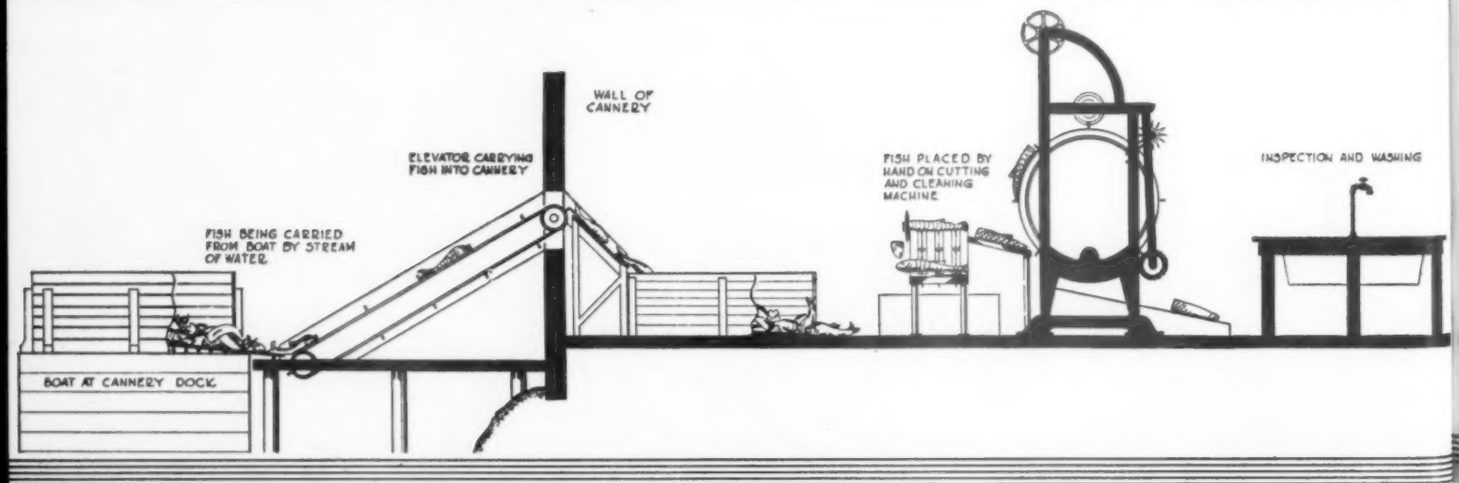
By means of the Requisition Index, department heads in the Nakat plant can estimate the variety and the approximate quantity of supplies that will be required for each season's work without fear of overlooking anything. They then fill out, in duplicate, a requisition form. This differs from the type of requisition ordinarily used in industrial plants, for instead of calling for a single specific item, it is a listing following in general the outline of the Requisition Index and providing space for 26 items on a sheet. It includes a report of consumption of each item during the previous season, the quantity on hand in inventory, and dollar valuation of inventory supplies. The requisition is checked and approved by the General Superintendent and General Manager. The white original copy goes to the purchasing department; the buff carbon copy goes into the cannery files for reference.

Purchase information is entered on the requisition—order number, vendor, cash discount terms, quality or brand, list price, trade discount, whether to be shipped from Seattle, and the tonnage, weight and measure, this last item being important in allocating shipping space for the marine operations.

In addition to supply and price information obtained from the salesmen who call at the plant, price inquiry forms are mailed to prospective suppliers, with a definite deadline date for quotations to permit ordering in time to meet the need. Since many of the items can be grouped for procurement from a single vendor — hardware, food, medical, etc.—the inquiry form is also prepared in the form of a listing, 22 items per sheet. The vendor inserts grade or brand he proposes to furnish, list price, trade and cash discounts, directly on the inquiry sheet and returns it to the purchasing department. By this procedure, the comparison of bids is made easier.

Ability to deliver is the first consideration, because the fishing expeditions must go out on schedule; salmon which are ready to spawn do not wait around to be caught and packed. For the same reason, ordering is done well in advance.

WHAT HAPPENS


WALL OF CANNERY
ELEVATOR CARRYING FISH INTO CANNERY
FISH BEING CARRIED FROM BOAT BY STREAM OF WATER
BOAT AT CANNERY DOCK
FISH PLACED BY HAND ON CUTTING AND CLEANING MACHINE
INSPECTION AND WASHING

Price is the second consideration, also an important one.

In respect to the packing equipment at the plants, the alert purchasing agent in this industry keeps closely in touch with all manufacturers, and does not rely only on the big name companies in the field. Competitive efficiency is a major concern, and experience shows that new machines and canning devices are constantly being developed by various manufacturers, some of whom are specialists in serving this particular industry.

It is a responsibility of the purchasing department to check invoices promptly against the data on his inquiry forms and orders, before passing them along to the accounting department for payment. The time element is important here, too, for if mistakes are made in regard to any discrepancy it frequently happens that corrections and adjustments must await the end of the season, and that may be too late.

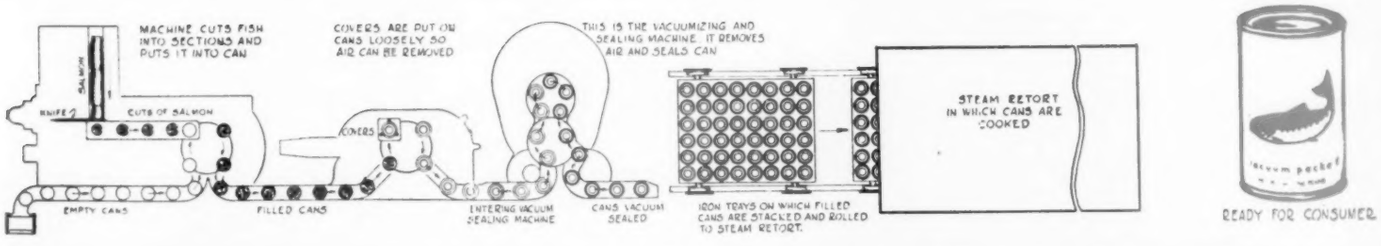
A moderate surplus of supplies at the close of a season is considered a healthy sign of good procurement, though extensive overages are of course to be avoided. Careful records of past purchases and consumption are therefore kept as a guide for the future, and the purchasing program is planned to provide just a little more than the indicated need, so as to have a margin of safety.

Some types of surplus supplies—such as fishing nets, barometers, tarpaulins, and machinery—can be stored away for use in the next season. But others—such as perishable foods and medical supplies—are usually sold at public auction in Seattle.

Excerpts from the
REQUISITION INDEX
The Nakat Packing Corporation
Seattle, Washington

Absorbent Cotton	Alarm Clocks	Antiphlogistine	Armbands
Acetylene	Alcohol, Denatured	Antiseptic Needles	Arnica,
Acid, Boracic	Alcohol, Rubbing	Anvils	Arsenic
Acid, Carbolic	Alcohol & Resin Flux	Apparatus, Fire	Asbestos Blocks
Acid, Muriatic	Alemite Fittings	Apple Butter	Asbestos Cement
Acid, Oxalic	Allspice	Apple Jelly	Asbestos Pipe Covering
Acid, Salicylic	Almond Extract	Apples, Canned	Asbestos, Sheet
Acid, Tool Marking	Ammeters	Apples, Dried	Ash Hardwood
Adhesive Tape	Ammonia, Kitchen	Apples, Fresh	Asparagus, Canned
Adrenalin	Ammonia Refrigerant	Apricots, Canned	Asparagus, Fresh
Adze, Carpenters	Ammonia, Bakers	Apricots, Dried	Asphalt
Adze, Coopers	Ammonia Liniment	Aprons, Kitchen	Aspirin Tablets
Adze, Ships	Ammunition	Aprons, Oil	Augers, Boom
Air Cocks	Analgesic Balm	Aprons, Waiters	Augers, Carpenters
Air Compressor	Anesthetic, Ether	Arc Lights	Augers, Ships
Air Gauges	Anchors	Arctic Sox	Auto Creepers
Air Hoists	Anchor Chain Hooks	Argyrol	Axes, Double Bit
Air Receivers	Anchor Shackles	Arms, Cross	Axes, Single Bit
Macaroni	Mandrills, Blacksmith	Mazda Lamps	Mirrors, Small
Mace	Manifest Blanks	Mazola Oil	Mirrors, Large
Machine Bolts	Mapleine	Measures	Mixing Bowls & Pans
Machine Screws	Marking Brushes	Meat Choppers	Molasses
Machinery, Canning	Marking Dies, Can	Meat Forks	Molasses Gates
Machinery Spraying	Marking Pots	Meat Platters	Mooring Chain
Machinery, Refrigeration	Marlin	Meat Slicers	Mops
	Marlin Spikes	Meats, Canned	Mop Handles
Machinery, Transmission	Masher, Potato	Meat, Fresh	Mosquito Netting
	Masts	Meat, Mince	Mothersills Seasick Remedy
Mackerel, Salt	Mast Hoops	Meat, Smoked	Mortise Locks
Mackinaw Coats	Mast Coat Lead	Mending Twine	Motor Kit Pliers
Magic Yeast	Mast Sheaves	Mentholatum	Muffin Pans
Magnesia Blocks	Matches	Metals	Mush Bowls
Magnesia, Milk of	Match Hooks	Metal Sheets	Mustard
Magnesia Pipe Covering	Mats, Door	Metallic Hose	Musterole
	Mattocks	Mild Steel	Mutton, Fresh
Magnetos	Mattresses	Milk, Canned	Mutton, Canned
Magneto Repairs	Mauls, R'way Spike	Milk Pitchers	
Mallets	Mauls, Top	Minced Collops	
Umbrellas	Underwear	Unions	Urinals
Vaccine	Vanilla Extract	Vegetables, Canned	Vinegar
Vacuum Gauges	Varnish	Vegetables, Dried	Vinegar Cruets
Vacuum Machines	Varnish Remover	Vegetables, Fresh	Vises
Valves	Vaseline	Vermicelli	Vizors
Valve Discs & Seats	Vegetable Dishes	Vienna Sausage	Voltmeters

IN THE CANNERY


MACHINE CUTS FISH INTO SECTIONS AND PUTS IT INTO CAN
SALMON
KNIFE
CUTS OF SALMON
EMPTY CANS
COVERS ARE PUT ON CANS LOOSELY SO AIR CAN BE REMOVED
COVERS
FILLED CANS
ENTERING VACUUM SEALING MACHINE
THIS IS THE VACUUMIZING AND SEALING MACHINE. IT REMOVES AIR AND SEALS CAN
CANS VACUUM SEALED
IRON TRAYS ON WHICH FILLED CANS ARE STACKED AND ROLLED TO STEAM RETORT.
STEAM RETORT IN WHICH CANS ARE COOKED
vacuum packed
READY FOR CONSUMER

HOW TO READ A PRICE INDEX

Figures don't lie; neither do they speak the truth clearly unless you understand the language

By STUART F. HEINRITZ

COMMODITY price indices are probably the most common form of business indicator used by purchasing men as a reference and guide in their work. It is important, therefore, to know what a price index really is, how it should be read, what it tells us, and—equally important—what it does not tell us about the markets for the things we buy. For purposes of illustration and reference in this article, there is reproduced herewith a section of the Bulletin of the National Association of Purchasing Agents as released on January 2nd, 1946, showing price indices at the turn of the year.

A price index is a statistical device, based on factual historical data, to show a comparison of the price position of a group of commodities in relation to the price position at some previous period. The basic data is readily available to anyone who wants to make his own comparisons and build his own index. The pertinent current quotations on which all indices are built are regularly reported in daily, weekly and monthly business publications specializing in this type of service, or are available from government sources, for anyone to use. It is of course much more convenient to use the calculations that are regularly made by competent statistical organizations, for there is a lot of research, record keeping, and mathematical computation involved.

Accuracy of Index

Since the actual compilation of the index figure is primarily a mathematical exercise, the established indices may all be accepted as accurate and reliable. Why, then, do we find four indices quoted on this page, with a range of 106.8, 111.5, 117.2, and 187.3, all as of December 28, 1945, and how can we reconcile these differences? The answer is simple. It depends on the selection of items that go to make up these respective indices and the relative weight given to these items. McGill's index is based on 129 commodities, selected as representative and significant to the industrial buyer. Fisher's index is based on 131 commodities, chosen rather to reflect consumer items going to make up the "cost of living", the purchasing power of the consumer dollar. The general index of the Bureau of Labor Statistics comprises 784 items, a broader field in which individual price fluctuations tend to be averaged out except for the underlying longer term trends, and the basic commodity index of the latter organization is confined to 28 items, where individual fluctuations would be expected to show a much greater effect on the index. Furthermore, while the first three of these indices are somewhat comparable in that they all referred to 1926 prices as the starting point, the last one is referred to August 1939. A glance at the McGill index for the end of 1939 shows that this was a period of generally depressed prices below the 1926 standard, so that the rise from 1939 to 1945 would naturally be much sharper than a 1926-1945 figure. This accounts for the high quotation of 187.3 on a straight mathematical basis. If the McGill index were based on December 1939 as 100, instead of on 1926, his index number for December 1945 would stand at 151.1 instead of 111.5.

The first principle in reading price indices, therefore, is to consider each one separately and for itself, for there is no common basis of comparison between any two of them. You can't use Fisher one week and McGill the next and expect to make any sense, though there may be real information and value in following both of them, separately, from week to week. But to see accurate trends it is necessary to follow some one index consistently. Pick the one that comes closest to reflecting conditions in the markets of your particular interest and is best suited to your needs. In addition to those cited above, you might choose the Annalist index (73 commodities in 8 groups, based on 1913), Babson (87 commodities in 4 groups, based on the 1908-1912 average), Dun & Bradstreet (96 commodities in 13 groups, calculated as the total cents per pound of all commodities represented), National Fertilizer Association (456 commodities in 14 groups, based on the 1926-1928 average), or the New York Journal of Commerce (110 commodities in 10 groups, based on the 1927-1929 average). Each of these has its own special features and characteristics of selection, scope, and weighting, that make it particularly adaptable to certain uses.

A General Picture

The second thing to remember about a price index is that it is an average, presenting a general picture rather than a specific one. It is useful, therefore, to break it down into groups of related commodities, as is done in all these cases. But even with this more detailed picture, there are individual items which run counter to the general trend at any given time, in degree or even direction, and purchasing men are interested in specific items.

For example, the McGill index for all commodities stands at 111.5, but ten of the groups making up the index are below that figure, with a variation of as much as 25.9 points in the case of non-ferrous metals, while six of the groups stand higher than the general index, with a variation of as much as 25.6 points in the case of vegetable oils. We shall therefore do well to rely chiefly on the respective group indices for our current appraisal of price positions, referring to the all-commodity index figure as an indicator of how these specific groups stand in relation to the overall price trend.

Third, in evaluating price position and trend, we shall fall into error if we make our comparisons from group to group—assuming, for example, that fuel prices (at 94.5 or 17 points below the general index) are unduly depressed, whereas building materials (at 129.2, or 17.2 points above the general index) are unduly inflated. As a matter of fact, if we trace the price history of these two groups for the past

The Bulletin of the National Association of Purchasing Agents

Vol. XVII, No. 1 *Released January 2, 1946*

Weekly Commodity Indices—1926=100

Prepared for the National Association of Purchasing Agents, by McGill Commodity Service, Inc.

	Dec. 27, 1929	*Dec. 29, 1939*	*Dec. 27, 1940*	*Dec. 26, 1941*	*Dec. 24, 1942*	*Dec. 24, 1943*	*Dec. 22, 1944*	*Jan. 5, 1945*	*Dec. 21, 1945*	*Dec. 28, 1945*
ALL COMMODITIES	88.0*	73.8	75.0	90.9	99.6	103.9	107.6	107.3	111.7†	*111.5*—
Industrial	84.9*	81.0	80.4	90.9	94.6	98.9	101.5	101.6	105.4	105.6+
Agricultural	89.4	67.4	62.9	83.9	93.6	102.3	104.7	104.1	108.7†	*108.1*—
Livestock	90.4	62.0	74.3	101.8	122.2	118.3	127.6	127.3	133.5	133.6+
Building Materials	90.0	96.3	105.0	105.7	112.1	118.4	125.3	125.3	129.2	129.2
Chemicals	105.0	88.6	89.0	90.9	99.7	99.1	99.1	99.1	100.5	100.5
Fuels	71.6	72.3	72.1	78.0	78.9	89.1	89.9	89.9	94.5†	94.5
Hides and Leather	112.0	97.6	90.3	106.8	107.3	107.3	107.3	107.3	107.3	107.3
Nonferrous Metals	97.0	79.8	79.3	81.3	83.5	83.4	83.2	83.3	85.6	85.6
Ferrous Metals	93.6	102.3	103.7	103.8	104.1	104.1	104.1	104.1	108.4	108.4
Paint Materials	94.6*	79.5	73.6	91.5	105.9	115.2	120.9	120.9	126.3	126.3
Paper and Pulp	93.4	87.6	90.3	97.9	99.1	102.0	105.2	105.2	108.4	108.4
Textiles, fine	90.8	75.4	69.5	97.0	105.6	104.9	110.9	111.3	115.8	116.1+
Textiles, coarse	75.9*	89.2	68.8	97.9	95.7	100.3	100.3	100.3	100.3	100.3
Vegetable Oils	100.7*	76.4	68.8	115.5	129.8	137.2	136.6	136.6	137.1	137.1
Sensitive Agricultural	87.1*	71.3	63.1	88.3	96.9	106.9	107.7	107.5	113.7	113.8+
Sensitive Industrial	76.6*	68.3	72.2	77.5	81.2	84.5	87.1	87.1	88.3	88.3

Note: Price declines are emphasized by *italics* and price increases by **bold** type. * December Average. † Revised.

Professor Irving Fisher, of Yale University, announced that last week's wholesale commodity prices, based on Dun's quotations, averaged 117.20%. The monthly average for December was 116.90. The average for the full year 1945 was 115.32. Purchasing power of the dollar, on a 1926 basis, was 85.32, and the December average was 85.54. The 1945 average was 86.72. The index for the past four weeks follows:

	U. S. (Fisher)	*Dollar Purchasing Power*
December 28	117.20	85.32
December 21	117.14	85.37
December 14	116.95	85.51
December 7	116.32	85.97

—Trade and Money Index.

Primary market prices rose .1% during the week ended December 22. The Bureau of Labor Statistics weekly index, at 106.8% of the 1926 average, was .1% above four weeks ago, and 2.1% higher than the corresponding week of 1944.

The Bureau's daily index of 28 basic commodities for the week ended December 28 was 187.3% of the August, 1939 average.

—U. S. Dept. of Labor Bureau of Labor Statistics.

Trade Review

Wholesale ... close to peak levels last ... of buying ever recorded for that month. Reports on inventory levels indicated year-end stocks for most lines equal to or slightly smaller th...

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four years, we find that the percentage of increase over this period has not been very dissimilar—21.1% for the fuel group, and 23% for building materials. And our true basis of comparison is along these horizontal lines of the table, within the respective commodity groups, remembering that the index purports only to compare current prices with the corresponding prices of 1926, and that the breakdown into groups is primarily designed to give us a more accurate picture of that comparison, rather than posing one group against another.

The relative price position of the groups today reflects a relationship that existed at the time of the base period, and it is altogether conceivable that the relationship at that time may have been even more out of balance than at present. Base periods are selected because they are presumed to represent an approximately "normal" situation, but there will always be a difference of opinion as to what constitutes a normal or equitable price situation. The argument about "parity" of prices, which has raged for a dozen years as between farm and manufactured products, has its counterpart in the consideration of nearly any of the groups represented in the price index. The statistician can only be realistic in reporting the situation—as it was and as it is. This is the reason why several of the indices are based on average prices over a period of 3 to 5 years, rather than on any specific point which "freezes" a basic relationship between the various groups; they reason that averaging the fluctuations over the more extended period gives a fairer picture and minimizes the influence of temporary conditions.

As an illustration of how the selection of a base period affects index figures, let us suppose that the McGill index were based on December 1940 prices rather than on 1926. This was not a normal period. The great depression was nearing its end and the war influence was just beginning to be felt. All but two of the commodity groups were below the 1926 price level, in varying degrees, and readjustments were still going on in both directions as recovery lagged in some fields and was accelerated in others. Here are three indices, all mathematically

accurate, but presenting radically different pictures:

December 1940 Index 1926=100	
All Commodities	75.0
Industrial	80.4
Agricultural	62.9
Building Materials	105.0

December 1945 Index 1926=100	
All Commodities	111.5
Industrial	105.6
Agricultural	108.1
Building Materials	129.2

December 1945 Index 1940=100	
All Commodities	148.7
Industrial	131.3
Agricultural	171.8
Building Materials	123.0

According to the second tabulation, agricultural prices have achieved substantial parity from the depth of their depression five years ago, industrial prices have lagged behind the general increase (doubtless due in large part to price controls), and building materials are still far above the general level. According to the third tabulation, farm prices have outstripped the other groups, increasing half again as fast as the general price level, and building materials have lagged behind the general trend (because they were more firmly held during the depression).

Proper Evaluation

This illustration also points out the fourth principle of reading index figures. Not only must they be interpreted along the horizontal lines of the table, group by group, but they must be evaluated in terms of the base period. The 1926 base is not necessarily significant to the buyer, nor is a comparison of present prices with that earlier data. But what has happened along the way may be very significant. The buyer is concerned now with 1946 prices, but it is very useful to him to know how prices in specific fields follow general trends, whether they fluctuate within wide limits or narrow ones, whether they react and recover slowly or swiftly, whether new relationships are being established, whether continued pressure may be expected upwards or downwards in any given field to approach a normal balance.

The fifth principle is a corollary: the index number has no great importance as a quantitative measure in itself, but is significant as indicating a trend. A group price index of 108.1 is high when the general index stands at 100, but it is low when the general index stands at 111.5. And the month-to-month comparison is even more important, for the direction in which an index is traveling should be carefully watched.

For this reason, in using a price index, it avails little to depend on the latest current figure as an isolated statistic. If the figures are published weekly, for example, without reference to previous compilations, the purchasing agent himself should tabulate the information to show these trends on a continuous basis, showing at least the previous week or two, the previous month, and preceding key points in sufficient detail to establish the trend line clearly. Where seasonal fluctuations are involved, even greater detail of past history may be advisable. Perhaps the best method is to chart the index on cross-section paper to add the visual effect of increase and decrease in the course of prices and to dramatize the comparisons and trends. This is not an arduous task, for the numerical values can be transferred directly to the charting paper, and once the basic chart has been prepared, it requires merely the insertion of the current week's figure to bring the record up to date. If price indices have any value whatsoever as a guide to purchasing policies and the understanding of market situations, this slight additional effort is well worth while.

The sixth principle is a reminder that no index can take the place of specific information regarding the particular items that a buyer is called upon to purchase. At best, it is background information against which a particular purchase can be evaluated, and against which the accomplishments of a purchasing program can be measured. In undertaking any specific buying assignment, it is the specific price and specific trend, not the average, that

Continued on page 356

"SET 'EM UP FOR EVERYBODY-TOM- I SAID NO TO A SALESMAN FOR THE FIRST TIME SINCE 1940!"

POSSIBILITIES OF ATOMIC POWER

By L. W. CHUBB, Director
Research Laboratories
Westinghouse Electric Corporation

AN attempt to set atomic power into its proper place in the engineering world is about as difficult as a prophesy of the future of electricity might have been at the time of the first electric lamp. Only more so. Generation and production of electric power were allowed to follow a natural course as dictated by engineering developments and economics. But superimposed on the technical developments of atomic power will be political and military controls, the extent and effects of which are still undetermined. In appraising the technical and economic possibilities of atomic power, however, a few facts stand out clearly.

1. Atomic power is an actuality. The atomic-energy piles at Hanford, Washington, are continuously delivering several hundred thousand kilowatts of thermal energy, enough to raise sensibly the temperature of the Columbia River.

2. The cost of that energy, which is a byproduct, if known, has not been made public. It would seem, however, that it must be high, probably many times that of other fuels. The costs of preparing sufficient purified uranium for practical piles are likely quite high. Furthermore, complete "burning" of a prepared lump of uranium is not possible. Just as ash accumulates around a chunk of burning coke, which tends to slow down or stop the combustion, so the nuclear processes produce substances that retard the reaction. In a relatively short time the "poisoning" reaches such a degree that a complete and expensive refining operation must be performed or the uranium discarded.

3. Controllable atomic-energy generators of smaller size and weight are possible now. However as the size comes down the richness of the fissionable material must be increased. Costs rise astronomically with degree of enrichment.

4. The fission products are strong ly radioactive for periods varying from seconds to years. Radiations from the power source are extremely hazardous to any form of life. Protective measures require thick barriers of appropriate materials. The bulk and weight of safety devices for small power plants would far exceed that of the pile itself.

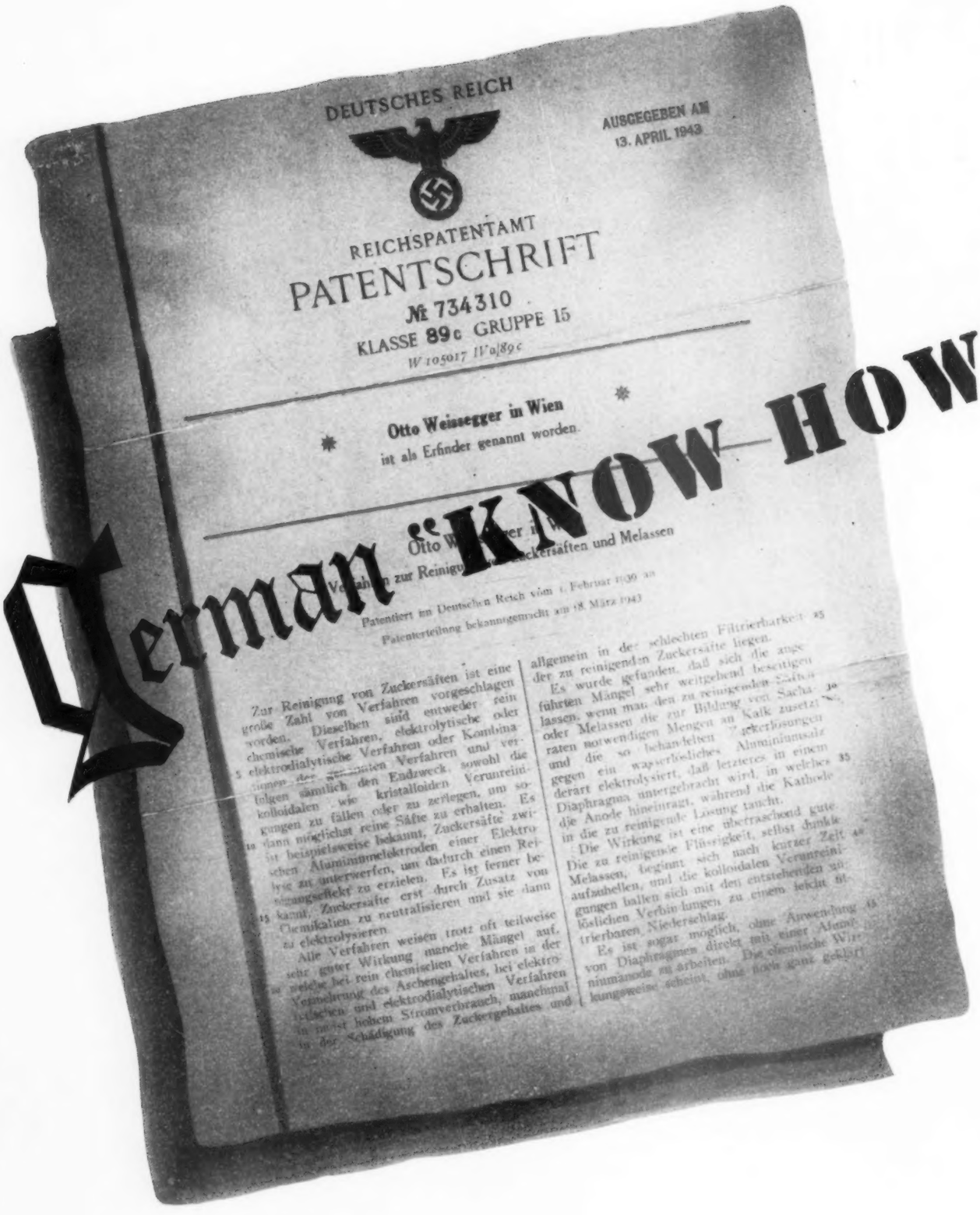
5. Fission is now accomplished with uranium isotopes, and plutonium which is derived from uranium. The amount of uranium ore and its distribution over the earth, if known, has not generally been disclosed.

6. Nuclear reactions to achieve energy release with other elements is theoretically possible and may be practical although no announcement of such has been made. Thorium is one possibility. It should be remembered that heat is available either by fission of heavy atoms into elements near the middle of the atomic scale, or by synthesis of lightweight elements into higher ones. Heat from the sun is thought to be energy released from the combination of hydrogen atoms with helium atoms by successive nuclear reactions.

7. Atomic power almost assuredly will become a practical power source, likely apparent application is for ship propulsion, or large power and heating plants using atomic fuel. Small-size power plans for private vehicles appear impractical. Above all—aside from governmental controls—the laws of economics will apply. Inasmuch as fuel costs are only a portion, sometimes quite small, of the total power-production costs, investment costs and special performance requirements may be the deciding factor. If the equipment costs for an atomic power plant are high, the plant may not be able to justify itself even if the atomic-reaction material were to cost nothing.

These practical difficulties, large though they be, should not obscure the fact that atomic power presents to the technical man enormous, fascinating opportunities and to the average citizen the greatest force of all time, for good or evil as he sees fit to use it.

German "KNOW-HOW"


DEUTSCHES REICH

AUSGEGEBEN AM 13. APRIL 1943

REICHSPATENTAMT

PATENTSCHRIFT

№ 734310

KLASSE 89c GRUPPE 15

W 105017 IVa/89c

Otto Weissegger in Wien

ist als Erfinder genannt worden.

Otto W... Zuckersäften und Melassen

Verfahren zur Reinigu...

Patentiert im Deutschen Reich vom 1. Februar 1939 an

Patenterteilung bekanntgemacht am 18. März 1943

Zur Reinigung von Zuckersäften ist eine große Zahl von Verfahren vorgeschlagen worden. Dieselben sind entweder rein chemische Verfahren, elektrolytische oder elektrodialytische Verfahren oder Kombinationen der genannten Verfahren und verfolgen sämtlich den Endzweck, sowohl die kolloidalen wie kristalloiden Verunreinigungen zu fällen oder zu zerlegen, um so dann möglichst reine Säfte zu erhalten. Es ist beispielsweise bekannt, Zuckersäfte zwischen Aluminiumelektroden einer Elektrolyse zu unterwerfen, um dadurch einen Reinigungseffekt zu erzielen. Es ist ferner bekannt, Zuckersäfte erst durch Zusatz von Chemikalien zu neutralisieren und sie dann zu elektrolysieren.

Alle Verfahren weisen trotz oft teilweise sehr guter Wirkung manche Mängel auf, welche bei rein chemischen Verfahren in der Vermehrung des Aschengehaltes, bei elektrolytischen und elektrodialytischen Verfahren in meist hohem Stromverbrauch, manchmal in der Schädigung des Zuckergehaltes und allgemein in der schlechten Filtrierbarkeit der zu reinigenden Zuckersäfte liegen.

Es wurde gefunden, daß sich die angeführten Mängel sehr weitgehend beseitigen lassen, wenn man den zu reinigenden Säften oder Melassen die zur Bildung von Sauerstoff raten notwendigen Mengen an Kalk zusetzt und die so behandelten Zuckerlösungen gegen ein wasserlösliches Aluminiumsalz derart elektrolysiert, daß letzteres in einem Diaphragma untergebracht wird, in welches die Anode hineinragt, während die Kathode in die zu reinigende Lösung taucht.

Die Wirkung ist eine überraschend gute. Die zu reinigende Flüssigkeit, selbst dunkle Melassen, beginnt sich nach kurzer Zeit aufzuhellen, und die kolloidalen Verunreinigungen ballen sich mit den entstehenden unlöslichen Verbindungen zu einem leicht filtrierbaren Niederschlag.

Es ist sogar möglich, ohne Anwendung von Diaphragmen direkt mit einer Aluminiumanode zu arbeiten. Die chemische Wirkung scheint, ohne hier ganz geklärt

By A. N. WECKSLER

● Technical secrets of German scientific and industrial research are made available

BY THE TON

JUST as our armies opened up Germany in a physical sense, various Government agencies are prying into the secrets of process, invention and equipment developed by the Nazis to make them available to American industry.

During the war, Germany was sealed off from certain raw materials, and as a result her industry was forced to develop ersatz processes which hold possibilities of adaptation in this country. Salvage techniques took an ingenious turn. Synthetics were developed in many fields.

To uncover the German secrets, Government agencies sponsored teams of experts who went in almost in conjunction with military operations. They talked to scientific personnel, inventors, plant managers—seeking to gather all threads of the Nazi production story.

In some instances, the Germans were considerably advanced. There is the natural urge to compare their stage in development with our own, but this is impractical. The Germans were forced into different tangents due to their own peculiar problems of obtaining materials.

There are specific cases where the Germans followed an uncharted path, and developed some unique apparatus. These have been made available in detail to American companies. An example is the new German machine "Tonschreiber" for recording code or voice messages on magnetic tape. Complete reports on this development are available.

There are two sources through which companies may obtain information on German discoveries or developments.

The reports on processes and developments which were prepared by the teams of experts working under the sponsorship of the military services, the Foreign Economic Administration or other Government agencies, were considered highly confidential until the end of the war.

Currently these reports are being "declassified" (cleared for public release), and copies are made available by the Office of the Publication Board of the Department of Commerce.

More than 1,300 such reports have been assembled, and available for public inspection at the Department of Commerce. The Office of the Publication Board will provide photostats of the various reports at very nominal fees. The details of operating this public inspection system have not been worked out smoothly, but the important fact is that the information has been made available. Literally "tons" of these reports are in the process of issuance.

An early index of the initial 377 reports has been prepared, and a copy of this may be obtained at no cost on request to the "Office of the Publication Board, Department of Commerce, Washington 25, D. C." Among the reports available from this office is that describing the operation of the "Tonschreiber."

Another report concerns the German invention of "foamed coal," a porous material consisting of coal particles bound together with thermosetting resin. The inventor of the fuel reports interesting possibilities for its use, but some of its drawbacks have not been overcome.

Various reports covering developments in the chemical industry are of interest, in view of the prominence which Germany attained in this field.

In conjunction with the operation of the Office of the Publication Board, the policy of the Office of Alien Property Custodian is of great importance. The Alien Property Custodian confiscated approximately 32,000 enemy owned patents, and where such patents had not been contracted for by a U. S. national prior to the war, these patents are made available for use by any U. S. national.

The patents which are available for such licensing number more than 20,000, and illustrating the practical value of these patents, approximately 10,000 such licenses have been issued.

The licenses to use these patents are granted on a non-exclusive basis, royalty free. A $15 issuance fee is exacted. The patent licenses are revocable, but it is clearly indicated by the Office of the Alien Property Custodian that this reservation is largely formality, and that there is no intention to revoke the licenses.

Operation of the Division of Patent Administration, Alien Property Custodian, is entirely independent of the Office of the Publication Board, Department of Commerce. However, the patent licensing policy complements the issuance of the various reports being issued by the Board, as often the patents cover some phase of the process as reported.

Dissemination of information concerning patents available for licensing is highly organized. An "Index and Guide", giving detailed information on the policy and the mechanics of licensing, is available on request to the Division of Patent Administration, Office of Alien Property Custodian, Washington 25, D. C."

The Alien Property Custodian maintains libraries at its National Press Building office in Washington and at four field offices, where descriptions of the various patents available for licensing may be seen.

These field offices are located in the Field Building, 135 S. LaSalle Street, Chicago 3, Ill.; 120 Broadway, New York 5, N. Y.; 301 Guardian Bldg., Portland 8, Ore., and 17 Court Street, Boston 8, Mass.

Complete catalog of patents has been placed in many Chambers of Commerce for reference purposes, and in some public libraries.

PURCHASING FOR THE Cleveland School System

There's a major procurement operation involved in administering the public school system of a large city

By E. F. SMIRCINA,
Purchasing Agent, Cleveland Board of Education

THE Board of Education of the City of Cleveland operates 154 school plants in approximately 300 buildings. The average daily attendance in these schools is about 106,000 pupils, taught by approximately 3,300 teachers. These figures represent rather a substantial purchasing program, when translated into terms of maintenance and supplies.

In accordance with the laws of the State of Ohio, the Board of Education maintains three separate departments, which are administered by three officials: the Superintendent of Schools, who is in charge of the Educational Department; the Clerk-Treasurer, who also serves as Clerk of the Board of Education; and the Business Manager, who is in charge of the Business Department. Purchasing comes under the latter division. The administrative offices of the Board of Education are located at 1380 East 6th Street, in the downtown section of Cleveland.

Business Department

All supplies, books, equipment and services required by the Educational Department of the schools, or required for the operation and maintenance of the plant and buildings, are purchased through the Business Department. All of these purchases are made under the direction of the Purchasing Agent. Under his supervision are three buyers, who are assigned the duties of purchasing certain classes of materials. While each buyer purchases items in these categories regularly and is regarded as something of a specialist in his particular line, all of them have been trained to buy *all* categories, and are sufficiently versatile to do a competent job of purchasing items outside of their own special fields if necessary. This provides a highly desirable element of flexibility in a relatively small department charged with a big responsibility.

Also under the supervision of the Purchasing Agent are two typists who make out the proposals and purchase orders; a follow-up clerk; an invoice clerk, who checks invoices against the purchase orders and receiving reports and passes approved invoices to the Clerk-Treasurer for payment; and a price record clerk, who maintains a file of all transactions, entering the prices paid for various commodities for purposes of record and reference.

Purchases are made following receipt of a requisition, if and when the requisition has been approved by the appropriate department. All orders and contracts, of whatever nature, are issued to the vendor only after they have been certified by the Clerk-Treasurer to the effect that funds are available for payment of the materials or services called for, in the budget account of the department requisitioning the order.

Budgets for the fiscal year are set up for all schools and departments, and all expenditures are charged against the budget account of each school or department as they are certified.

Warehouse and Shops

In order to serve the schools promptly, efficiently and economically, the Business Department operates a warehouse, housing stockrooms, a chemical testing laboratory, a garage, a tool room, a sheet metal shop, and a cabinet and paint shop for the refinishing of school furniture.

The warehouse consists of a four-story fire-proof brick building and two detached one-story fire-proof brick buildings situated on a 2-acre site located almost in the geographical center of the school district. These buildings have a combined total of 82,000 square feet of floor space. In the warehouse are stocked approximately 1,500 different items, standardized for use in the Cleveland schools. Delivery of these items on approved requisitions is made by trucks owned and operated by the Board of Education.

The Business Department also employs mechanics in the various trades to maintain all buildings and

equipment in safe and shipshape condition.

Competitive bids are always solicited in procuring the needed supplies, equipment, and services. These consist of two classes.

Legal Requirements

The law of the State of Ohio prescribes a definite procedure to be followed whenever a Board of Education decides to build, repair, or equip a building, where the amount of the expenditure exceeds $3,000. This procedure requires:

(a) advertisement of the requirement in two daily newspapers for four consecutive weeks;

(b) a deposit, with each bid submitted, of a certified check or "bidding bond" in an amount not less than 5% of the bid;

(c) public opening and reading of the bids;

(d) a performance bond for 100% of the amount of the contract from the successful bidder; and

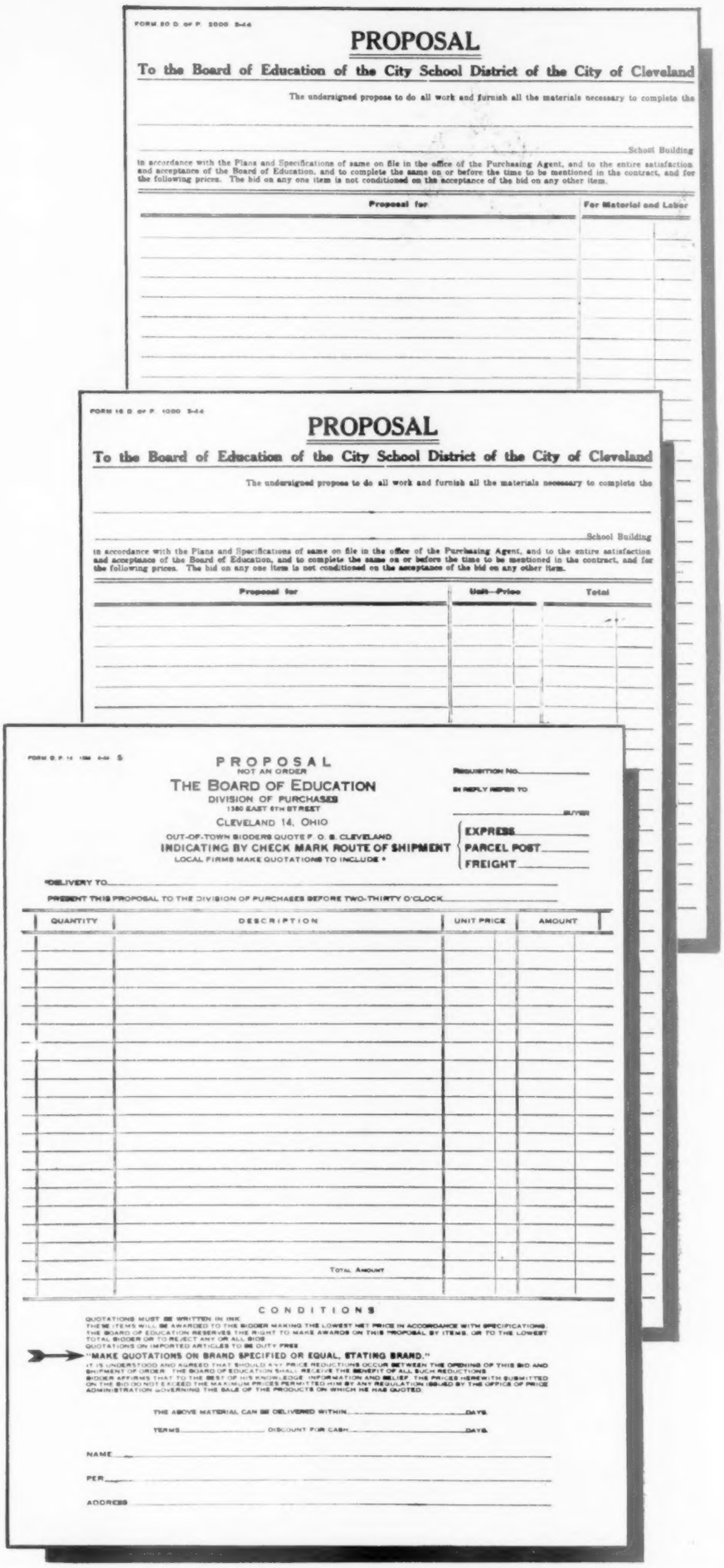
(e) award of the contract to the lowest responsible bidder.

The second class of purchases includes all those not defined in the above regulation. While no set procedure is prescribed by law for such cases, the Board of Education has adopted a policy that is essentially comparable, in that competitive bids are to be solicited in all cases by the Purchasing Agent. Requests for bids on this second class of items are posted on a bulletin board in the corridor of the Business Department, and are also mailed to lists of prospective bidders.

Where the requirement of any items in this classification amounts to a considerable purchase over the period of a year, and where a contract for this type of purchase is practicable for a year ahead, requests for such proposals are also advertised in the daily newspapers, in addition to posting and mail requests so as to develop the broadest possible field of supply. This procedure is used, for example, on such items as coal and other fuels, and for milk, bread, and ice cream for the school cafeterias.

Proposals and Bids

In the solicitation of bids, the Purchasing Agent furnishes the prospective bidders a blank proposal form, and all bids must be tendered on these forms. In the purchase of equipment or in the contract for the construction or repair of a building,



FORM 80 D. of P. 2000 5-44

PROPOSAL

To the Board of Education of the City School District of the City of Cleveland

The undersigned propose to do all work and furnish all the materials necessary to complete the

School Building

in accordance with the Plans and Specifications of same on file in the office of the Purchasing Agent, and to the entire satisfaction and acceptance of the Board of Education, and to complete the same on or before the time to be mentioned in the contract, and for the following prices. The bid on any one item is not conditioned on the acceptance of the bid on any other item.

Proposal for	For Material and Labor

FORM 16 D. of P. 1000 5-44

PROPOSAL

To the Board of Education of the City School District of the City of Cleveland

The undersigned propose to do all work and furnish all the materials necessary to complete the

School Building

in accordance with the Plans and Specifications of same on file in the office of the Purchasing Agent, and to the entire satisfaction and acceptance of the Board of Education, and to complete the same on or before the time to be mentioned in the contract, and for the following prices. The bid on any one item is not conditioned on the acceptance of the bid on any other item.

Proposal for	Unit Price	Total

FORM O. P. 14 1M 4-44 S

PROPOSAL
NOT AN ORDER

THE BOARD OF EDUCATION
DIVISION OF PURCHASES
1380 EAST 6TH STREET
CLEVELAND 14, OHIO

REQUISITION NO.
IN REPLY REFER TO
BUYER

OUT-OF-TOWN BIDDERS QUOTE F. O. B. CLEVELAND
INDICATING BY CHECK MARK ROUTE OF SHIPMENT
LOCAL FIRMS MAKE QUOTATIONS TO INCLUDE *

EXPRESS
PARCEL POST
FREIGHT

*DELIVERY TO

PRESENT THIS PROPOSAL TO THE DIVISION OF PURCHASES BEFORE TWO-THIRTY O'CLOCK

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
	TOTAL AMOUNT		

CONDITIONS

QUOTATIONS MUST BE WRITTEN IN INK.
THESE ITEMS WILL BE AWARDED TO THE BIDDER MAKING THE LOWEST NET PRICE IN ACCORDANCE WITH SPECIFICATIONS.
THE BOARD OF EDUCATION RESERVES THE RIGHT TO MAKE AWARDS ON THIS PROPOSAL BY ITEMS, OR TO THE LOWEST TOTAL BIDDER OR TO REJECT ANY OR ALL BIDS.
QUOTATIONS ON IMPORTED ARTICLES TO BE DUTY FREE.

"MAKE QUOTATIONS ON BRAND SPECIFIED OR EQUAL, STATING BRAND."

IT IS UNDERSTOOD AND AGREED THAT SHOULD ANY PRICE REDUCTIONS OCCUR BETWEEN THE OPENING OF THIS BID AND SHIPMENT OR ORDER, THE BOARD OF EDUCATION SHALL RECEIVE THE BENEFIT OF ALL SUCH REDUCTIONS.
BIDDER AFFIRMS THAT TO THE BEST OF HIS KNOWLEDGE, INFORMATION AND BELIEF, THE PRICES HEREWITH SUBMITTED ON THIS BID DO NOT EXCEED THE MAXIMUM PRICES PERMITTED HIM BY ANY REGULATION ISSUED BY THE OFFICE OF PRICE ADMINISTRATION GOVERNING THE SALE OF THE PRODUCTS ON WHICH HE HAS QUOTED.

THE ABOVE MATERIAL CAN BE DELIVERED WITHIN _____ DAYS.

TERMS _____ DISCOUNT FOR CASH _____ DAYS

NAME _____

PER _____

ADDRESS _____

Headquarters of the Cleveland Board of Education

generally comprising those purchases for which the procedure is prescribed by State law, Formal Proposal Blanks are used. There are two of these forms, a pink one used for bids on construction and repair work, and a white one used for bids on equipment. The difference in color makes them readily identifiable by those who handle them in the purchasing office.

On the pink form, the bidder lists each item on which he is bidding, setting down the price for materials and for labor separately for each item.

On the white form (equipment), the bidder quotes the unit price and total amount of each item.

Informal Proposals

The reverse side of both forms are identical, consisting of instructions to the bidder as to the procedure to be followed in submitting his offer to the Board for consideration.

In the purchase of these items for which no procedure is established by State law, the Informal Proposal Blank is used. This is a six-part fanfold form typed on a billing machine. The bidder retains a copy of each sheet representing his offer.

This form provides for inserting the requisition number, name of the buyer who is handling the bids, the method of shipment (all shipments are f.o.b. Cleveland), and columns for quantity, description, unit price, and amount on each item. Conditions of the bidding are printed at the bottom of the form. Since most proposals are made on the basis of a specified brand *or equal,* there is a strict rule that if the brand offered is different from the one named in the proposal, it must be so specified in the bid.

A specific date or time when bids must be submitted to the Purchasing Agent is typed on the proposal blank, and an envelope is furnished each bidder for his convenience in submitting his offer. This envelope is of a distinctive blue color to assist the mail department in the prompt sorting and dispatch of bids to the Business Department. The proposal blank and its envelope both bear the same number as the requisition issued for the requirement, so that they can be identified without opening. The sealed proposals are time-stamped when received and are held in a locked cabinet until the time set for their opening. No consideration is given to bids received after the time set for opening; late bids are returned unopened to the bidders.

Contracts and Orders

On formal bids, contracts can be authorized only by the Board of Education. Contract agreements are printed in a standard contract form which is a legal document, setting forth the obligation of the contractor to complete the work in an approved fashion in the period agreed upon, with a penalty clause for delay, and protecting the Board against failure on the part of the contractor to live up to his agreement. It also provides for monthly payments to the contractor while the work is progressing, after inspection and approval by the authorized representatives of the Board on the work up to date.

The performance bond is a standard surety bond which is supplied by the contractor for the full amount of the contract, and the surety must be approved by the Board also. In order to receive his monthly payment, the contractor files an "Application for Payment on Contract", stating the amount of the requested payment for work done during the period designated. The application must be certified by the Clerk-Treasurer after approval by the Inspector and Director of Schools. This is done after the figures have been checked against the records. The form is made out in quadruplicate. The white and yellow sheets go to the Clerk-Treasurer's office, the pink copy is returned to the contractor, and the blue copy goes to the division which approved the work.

Purchase Order

On informal bids, the award is made by issuing a purchase order. This is a nine-part fanfold form, consecutively prenumbered, typed on a billing machine. The various copies are processed and distributed as follows:

(1) Original — vendor's copy, printed in blue ink.

(2) Duplicate — accounting copy, printed in brown ink, to the Clerk-Treasurer.

The original and duplicate are submitted to the Clerk-Treasurer for certification of funds. If funds in the budget account shown on the order are available, the Clerk certifies the vendor's copy and returns it to the Purchasing Agent for signature and issuance to the vendor. The Clerk retains the duplicate, which is filed by purchase order number. The other copies, which have been held pending certification, are then distributed.

(3) Invoice clerk's copy, printed in brown. This copy is held in the "open" file until the work called for is completed, or the material is received and approved, and an invoice received. The invoice and signed receiving copy are then forwarded to the Clerk-Treasurer for payment of the invoice. The invoice is then date-stamped as "Paid" and is placed in the completed order file.

(4) Receiving copy, printed in green.

(5) Requisitioner's copy, printed in red.

Copies 4 and 5 are forwarded to the department where the requisition originated, to show that the order has been issued and that delivery may be expected. On satisfactory completion of the delivery, the maker of the requisition signs the receiving copy and returns it to the Purchasing Agent, retaining Copy No. 5 for his own file. In the purchasing department, the receiving copy, duly signed, is turned over to the invoice clerk for checking with the purchase order and invoice as outlined above. In the event that chemical test or analysis of the material is required before acceptance, or if material should be examined by an inspector, this is done before returning the receiving copy back to the purchasing department, and the copy is countersigned by the chemist or inspector as evidence of a satisfactory delivery.

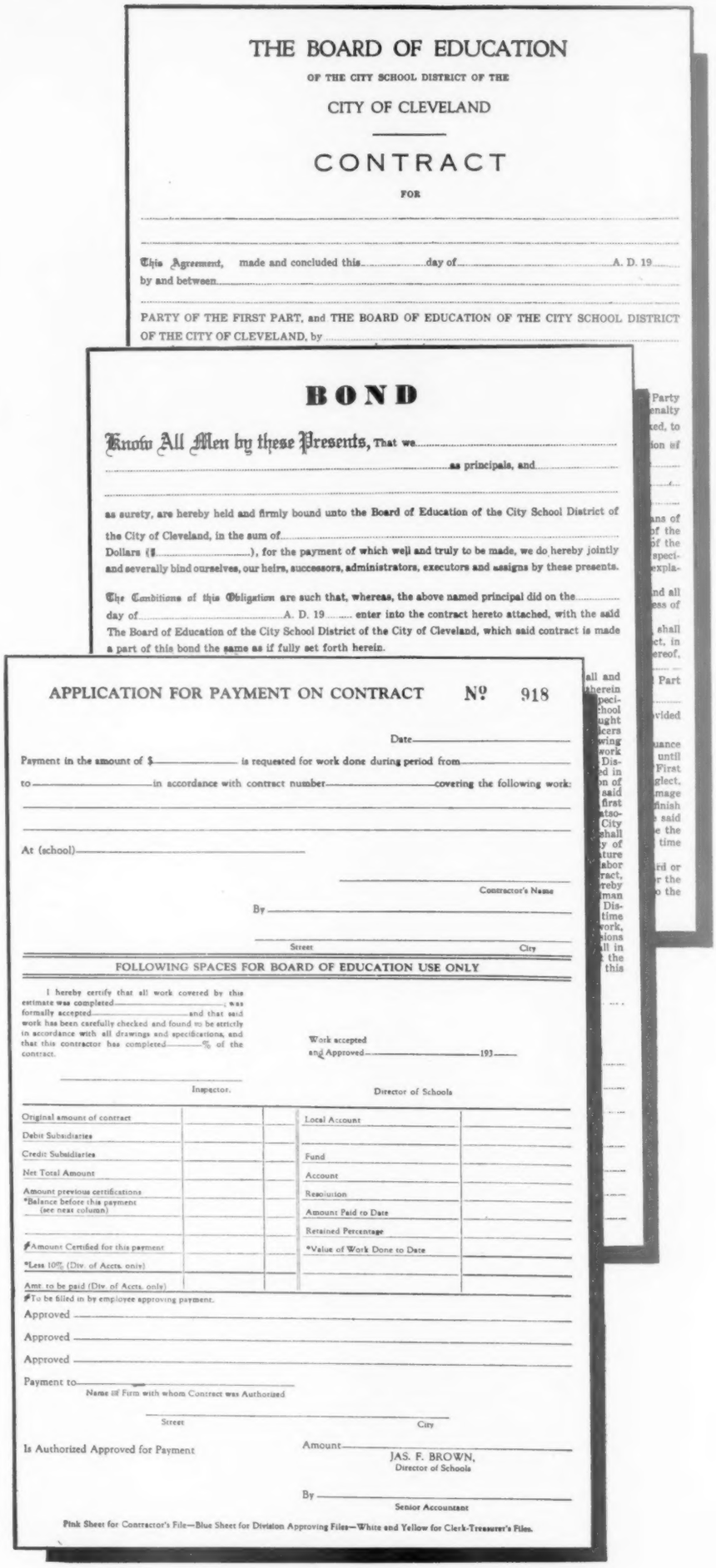
(6) Office copy, printed in black. From this copy, the commodity price record is posted. A price record is maintained on all items purchased. This record is kept according to commodities. It shows, for each purchase, the requisition and order number, date purchased, vendor, quantity purchased, price paid, and school or department for which the purchase was made. The Purchasing Agent always has available for all interested parties the price paid for any item, the name of the firm from whom it was purchased, and a tabulation of the bids received. After the entry has been made on the purchase record, the office copy of the order is bound in numerical order in a book which, when completely filled, contains 1000 orders.

Buyer's Copy

(7) Buyer's copy, printed in blue. Each buyer keeps a file, arranged alphabetically by vendors' names, of all purchase orders issued by him. This serves as a ready reference for follow-up purposes and for any inquiries that may arise in connection with the order. The order copy is removed from the file when the receipted receiving copy is returned.

(8) Requisition copy, printed in orange. This copy is filed according to the requisition number. It is used as an index to the purchase order number if the maker of the requisition, not having an order copy, should ask for any information concerning his requisition.

(9) Proposal copy, printed in purple. This copy becomes part of a



THE BOARD OF EDUCATION

OF THE CITY SCHOOL DISTRICT OF THE

CITY OF CLEVELAND

CONTRACT

FOR

This Agreement, made and concluded this ..... day of ..... A. D. 19 .....
by and between .....

PARTY OF THE FIRST PART, and THE BOARD OF EDUCATION OF THE CITY SCHOOL DISTRICT OF THE CITY OF CLEVELAND, by .....

BOND

Know All Men by these Presents, That we .....
..... as principals, and .....
..... as surety, are hereby held and firmly bound unto the Board of Education of the City School District of the City of Cleveland, in the sum of .....
Dollars ($ .....), for the payment of which well and truly to be made, we do hereby jointly and severally bind ourselves, our heirs, successors, administrators, executors and assigns by these presents.

The Conditions of this Obligation are such that, whereas, the above named principal did on the .....
day of ..... A. D. 19 ..... enter into the contract hereto attached, with the said The Board of Education of the City School District of the City of Cleveland, which said contract is made a part of this bond the same as if fully set forth herein.

APPLICATION FOR PAYMENT ON CONTRACT No. 918

Date .....

Payment in the amount of $ ..... is requested for work done during period from .....
to ..... in accordance with contract number ..... covering the following work:

At (school) .....

Contractor's Name

By .....

Street City

FOLLOWING SPACES FOR BOARD OF EDUCATION USE ONLY

I hereby certify that all work covered by this estimate was completed ....., was formally accepted ..... and that said work has been carefully checked and found to be strictly in accordance with all drawings and specifications, and that this contractor has completed ..... % of the contract.

Inspector.

Work accepted and Approved ..... 193 .....

Director of Schools

Original amount of contract			Local Account	
Debit Subsidiaries				
Credit Subsidiaries			Fund	
Net Total Amount			Account	
Amount previous certifications			Resolution	
*Balance before this payment (see next column)			Amount Paid to Date	
			Retained Percentage	
†Amount Certified for this payment			*Value of Work Done to Date	
*Less 10% (Div. of Accts. only)				
Amt. to be paid (Div. of Accts. only)				

†To be filled in by employee approving payment.

Approved .....

Approved .....

Approved .....

Payment to .....
Name of Firm with whom Contract was Authorized

Street City

Is Authorized Approved for Payment

Amount .....

JAS. F. BROWN,
Director of Schools

By .....
Senior Accountant

Pink Sheet for Contractor's File—Blue Sheet for Division Approving Files—White and Yellow for Clerk-Treasurer's Files.

Warehouse where 1,500 standard school items are kept in stock. Adjacent to this building are the machine shops, garage, tool house, cabinet and paint shop, and chemical testing laboratory.

complete file consisting of the requisition, proposals, and purchase order on each transaction. These papers are stapled together and filed under the purchase order number.

Requisitions

There are two types of requisitions for material used in the Cleveland Public Schools. Both forms must be properly approved before they can be acted upon.

The Stores Requisition is used in requesting the issue of items carried in the warehouse. The forms are in triplicate, and are prenumbered. The original and duplicate, when properly approved, are sent to the Clerk-Treasurer for certification of funds. The school or department issuing the requisition is charged for the item and the cost is deducted from its budget account, whether the items are furnished from the warehouse or from a vendor. If certified, both copies are sent to the warehouse. On fulfillment, the warehouse retains the original and returns the duplicate to the Clerk-Treasurer for deduction of cost from the particular budget. The triplicate is a file copy retained by the requisitioner.

The Purchase Requisition is used for requesting items that are not carried in warehouse stock, although they may be standard items but not ordered in sufficient quantities to warrant carrying as a stock item. The procedure follows much the same pattern as outlined for the Stores Requisition. Original and duplicate are passed along for the necessary approvals. If approved, the original is sent to the Purchasing Agent for action. The Purchasing Agent will secure bids and place the order, sometimes after consultation with the requisitioning or approving officers in respect to the bids if this seems desirable. The triplicate is the requisitioner's file copy.

Extent of Operations

To provide the Clevleand Public Schools with the books, supplies, and equipment necessary to educate the city's children in accordance with the high standards set up by our Board of Education and Superintendent of Schools, the purchases are many and varied, and the amount expended for these requirements is large. Approximately 22,000 orders are issued yearly, representing about $2,500,000 of expenditure. There is consumed annually for heating the school buildings about 45,000 tons of coal and 350,000 gallons of fuel oil. Fuel is carefully selected on the basis of economy and efficiency in relation to the type of individual heating plant, and on the basis of minimizing the smoke nuisance. Fuel is purchased on annual contract.

There are in the school system 34 self-supporting cafeterias, operated without profit for the pupils. The purchase of all food supplies and equipment, amounting to more than a half million dollars, is under the direction of the Purchasing Agent. Approximately 32,000 pupils eat lunch daily in these cafeterias. Typical food purchases include:

62,000 lbs. of chopped beef
82,000 doz. buns
2,900,000 half-bottles of milk
3,500 cases of fruits and vegetables in 10 lb. cans
16,000 lbs. of frozen fruits and vegetables
50,000 lbs. of frankfurters
62,000 loaves of bread
68,000 gals. of ice cream
450,000 lbs. of potatoes

Standardization

Although the number and kinds of commodities purchased are in the thousands, these items have been standardized as to type and quality, so far as possible. This standardization has enabled all the schools throughout the system to have the advantage of high and comparable quality in respect to the supplies and equipment used. Bids are requested with detailed specifications, written to insure wide and fair competition on definite standards of quality. The U. S. Bureau of Standards specifications have been adopted wherever feasible. All materials, supplies and equipment are subject to inspection or chemical analysis or both.

Since proposals are invited on the basis of specifications *or equal,* it sometimes develops that items differing in quality from the literal specification are found to be more desirable or economical. In the interest of fairness to vendors as well as value to the taxpayer, awards are not made in such a case unless the bids are all rejected and new bids requested on the changed specification. Not only is care taken to place all bidders on an equal footing through the use of clear and specific definition of quality, but special care is also taken that the Cleveland Public Schools receive material in accordance with the order and the specifications.

CHANGES IN COST COMPONENTS 1914—1945

The traditional ratios of material, labor and overhead as factors of cost are now in a period of readjustment due to increased prices, wages, and production efficiency

Here is a study of these basic factors to aid the purchasing agent in price analysis

By LOUIS WEINER

Economist, U. S. Department of Labor
Bureau of Labor Statistics

THE end of the war has increased the uncertainties that confront management. These uncertainties involve such business factors as markets, both domestic and foreign; sharpened competition; the size of the gross national product; employment and unemployment; and wages and productivity.

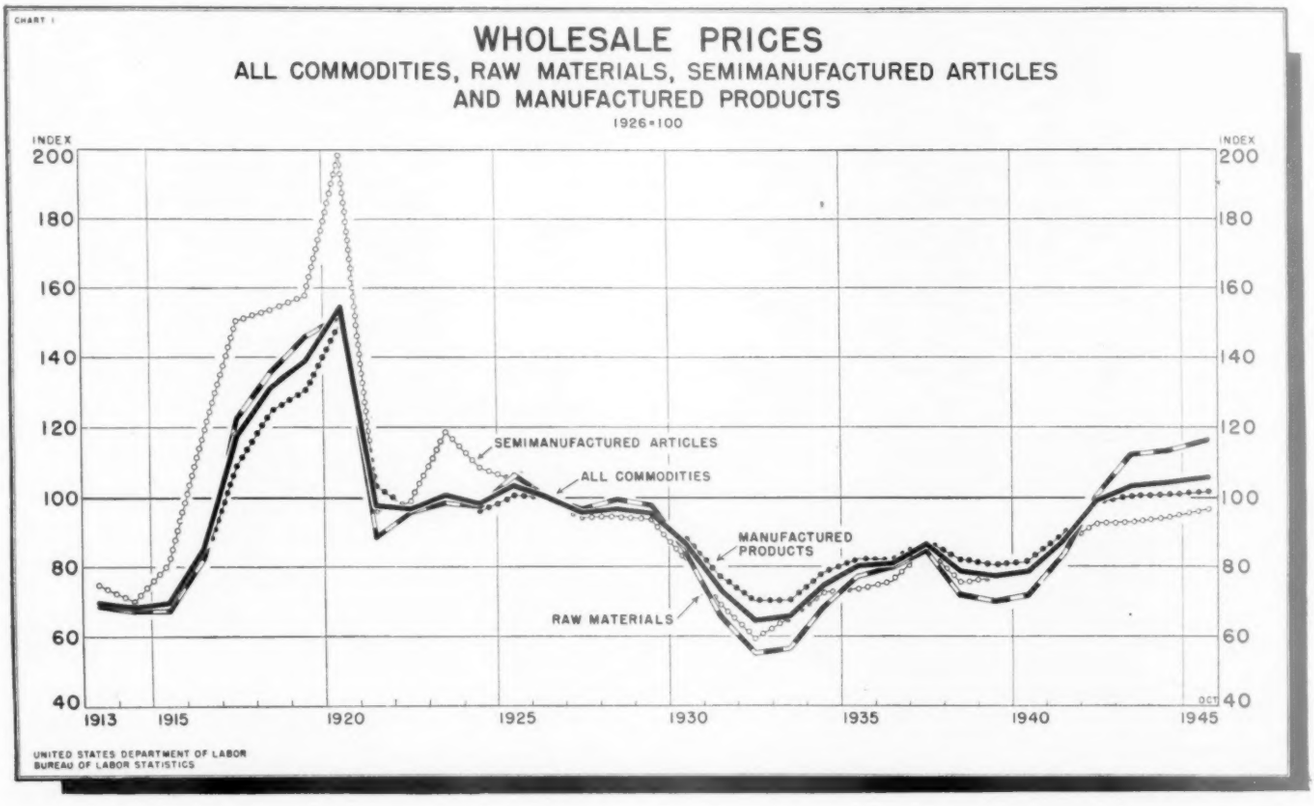
Purchasing agents are particularly concerned with prices and costs. Their efficiency is largely measured in terms of the prices they pay for goods with carefully defined and adequate specifications. During the war and the present transition period, ability to locate goods at almost any price has been a new test of success. Normally a careful purchaser goes beyond competitive bidding and attempts some analysis of the cost structure which determines the prices he pays. The larger the scale of his purchasing, the more vital it is that he do this, and the greater the possibilities of securing more advantageous terms. Adequate knowledge is one of the most important weapons in the bargaining arsenal.

But knowledge of the basic cost and price patterns is not only of aid in evaluating past performance and guiding current purchasing; when used with care and understanding, current patterns may be projected into the future, and the resulting guesses may exert a powerful push on present decisions. They determine decisions on the size of inventories; on whether to speed up or defer purchases; on future budgeting requirements.

The purpose of this article is to explore some of these cost and price relationships for industry in general from 1914 to 1939 and from 1939 to October 1945, in order to ascertain what changes have occurred during the war and to evaluate the current situation and the factors making for change in the future. It is hoped that this analysis may stimulate purchasing agents to make more detailed studies of their own for commodities and industries which are important to them.

I. The Price Background

Purchasing agents buy goods at several levels of distribution. These range from (a) raw materials direct from farm and mine, to (b) semimanufactured articles such as print



cloth and steel bars, to (c) manufactured products such as prepared paint, trucks, and furniture. Prices of raw materials move over wider ranges than do prices of other commodities, yet there are always strong forces which tend to restore the price balance between the various levels of production in the long run.

The good purchasing agent knows these short-run imbalances in any current market situation, and realizes the possibility of gains and losses. But the purchasing agent should be just as alert to the long-run relationships, and must always be on the watch for changes in the price situation. He must go beyond his own demand for a particular commodity—for the forces making for price change are far broader than the demand of one purchaser, and the price of a raw material that he buys in quantity may be largely determined by the price of a finished product which he may not buy at all. Purchasing agents will, therefore, do well to watch the movements of all prices, knowing that what goes up too far will eventually go down, and *vice versa*.

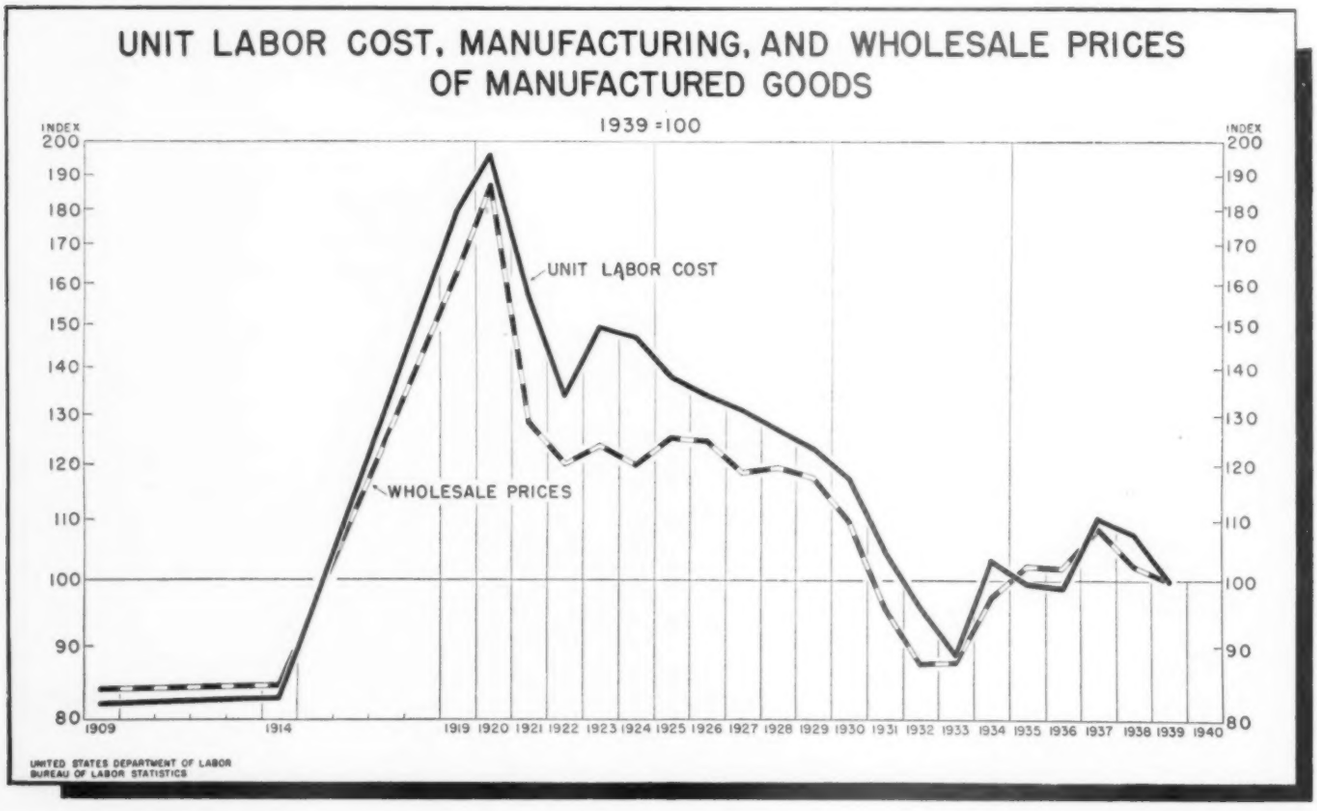
Chart I shows the movement of wholesale commodity prices for all commodities, raw materials, semi-manufactured articles, and manufactured products, from 1914 to October 1945, using 1926 = 100, as published by the U. S. Bureau of Labor Statistics. This chart indicates that over the period since the first World War the three major components of the wholesale price index had a tendency to move together. There have been significant short-run disparities, when one or another of the three has moved up or down more than the others. Raw materials (largely composed of farm products) have tended to rise higher in periods of great expansion (e.g., 1939 to 1945) and to fall lower in bad times (e.g., 1929 to 1933). But eventually prices for the three groups of goods tend to come together.

Stated in somewhat different fashion, there have been no *long-run* disparities in the price movements of these goods. Short-run variations, however, have been marked and significant. During World War I semi-manufactured articles increased far more in price than did either raw materials or manufactured products, and declined far more during the postwar price collapse. Raw materials showed the greatest decline in the depression of 1929 to 1933, but made good their relative losses during the recovery which culminated in 1937.

For World War II—as well as War I—prices have shown significant divergences, although the overall price increase has been far less during this war than it was 25-30 years ago. Wholesale prices of all commodities increased 41% from August 1939 to October 1945. Raw materials, starting from a relatively depressed level in 1939, have increased most, a total of 75% from August 1939 to October 1945, not only regaining their relative position by 1942, but increasing far more from 1942 to 1945 than the other types of goods sold. These prices are largely on farm products. Price control was imposed later on farm products than on manufactured goods and has not been as effective for a number of reasons.

Average prices of manufactured products increased 29% during this period, while prices of semi-manufactured articles, which had showed the greatest increase during World War I, moved up 30%. Of considerable portent for the future is the steady but slow rise in recent months of prices of both manufactured and semi-manufactured products.

On the basis of the long-run movements, we may predict that eventually the *levels of pricing for these three groups* are likely to draw close together again. However, the timing and nature of this readjustment are far from clear, primarily because we do not know how long



price control will be retained. At the moment, a reasonable guess is that the prices of manufactured and semi-manufactured products are likely to advance somewhat faster than those of raw materials in the next year. War price controls have been tighter in these commodities than on farm products which bulk so important in raw materials. Moreover, pressure for wage rate increases in manufacturing industries are widespread.

The danger is real that postwar readjustments of various sorts will result in substantial price increases despite the present national stabilization policy and the determined efforts of OPA to "hold the line." This tendency is strongly supported by the great volume of accumulated war savings and the frantic scramble for various kinds of goods. We should not forget the lessons of the aftermath of World War I—the great price increase following the Armistice and the collapse in 1920 and 1921. We must not overlook, too, that OPA has found it necessary to grant many price increases in the past few months to compensate for increased costs. The reconversion price formula is evidence of a continuation of this policy. At the same time, prices for most farm products are likely to hold up pretty well for at least the next two years, not only because of strong world demand for these products, but because of the price support program which guarantees farmers 90% of parity for two years from the first of January following the end of the war.

It should be emphasized that price indexes of the Bureau of Labor Statistics are based on the prices of almost 900 commodities and that great variations in the movements of the individual commodities are concealed by the averages. These variations can be observed in summary fashion in the 10 maior groups and 48 subgroups of the Bureau of Labor Statistics wholesale price index. For example, from August 1939 to October 1945, prices of farm products increased 109% from their exceptionally low level at that time, textiles 49%, building materials 32%, and metals 13%. It is always dangerous to apply comprehensive averages to specific situations, even though the basic underlying economic variables exert forces in the same direction on all of them.

TABLE I

PERCENTAGE CHANGE FROM 1939 TO 1944 IN OUTPUT PER MAN-HOUR AND IN UNIT LABOR COSTS FOR SELECTED INDUSTRIES

Industry	Percentage Change from 1939-1944 in Output per Man-hour	Unit Labor Cost
Boots and shoes	5.2	47.8
Bread and other bakery products	11.2	22.9
Cane sugar refining	–4.0	38.2
Canning and preserving group	21.2	44.5
Cement	–15.5	52.2
Confectionery	9.3	36.0
Cotton goods	0.3	61.2
Fertilizers	9.0	58.4
Flour and other grain-mill products	–16.0	68.7
Ice cream	49.4	–6.9
Leather	14.2	27.9
Lumber and timber products: Sawmill	–1.0	69.7
Newspaper and periodical printing and publishing	–12.5	35.9
Nonferrous metals: Primary smelters & refineries	–3.4	52.6
Paints and varnishes	14.1	17.2
Paper and pulp group	–7.3	52.3
Rayon and allied products	41.5	–0.3
Slaughtering and meat packing	2.3	32.7
Tobacco products group	5.1	41.4
Woolen and worsted goods	16.9	39.9

SOURCE: U. S. Department of Labor
Bureau of Labor Statistics
Washington 25, D. C.
January 8, 1945

II. The Unit Labor Cost Background

Labor unit cost, which varies with changes in hourly earnings and with output per man-hour, is a second factor in cost, equal in importance to materials costs. The Bureau of Labor Statistics has compiled such data for many years. Chart II compares unit labor costs and wholesale prices of manufactured products from 1909 to 1939. Labor unit costs declined more than 50% from their peak in 1920 to 1933. During the 1920's, increases in average hourly earnings were far more than offset by tremendous increases in output per man-hour. From 1929 to 1933, average hourly earnings declined more than 20%, while productivity continued to increase. From 1933 to 1939, the increase in productivity was offset by greater increases in average hourly earnings, and unit labor costs rose more than 10%.

From 1939 to 1945, it is impossible to obtain a clear picture of what happened to labor costs in *all* manufacturing industry. The story is complicated by the emergence of the great munitions industries which were characterized by enormous increases in productivity as the war went on, but whose products were not comparable with civilian goods formerly produced by the heavy industries. The Bureau of Labor Statistics, however, has constructed an index of unit labor costs for 24 non-munitions industries, and a wholesale price index for the products of these industries.

From 1939 to 1944, unit labor costs increased 42% and prices 32%. There is, of course, consider-

able variation among industries. For example, unit labor costs for rayon and allied products declined very slightly during this period, while those for boots and shoes increased 48%, for cotton goods 61%, for paper and pulp products 52%. Output per man-hour revealed widely different patterns from industry to industry. Some showed consistent increases for the five-year period; others showed a net decline. But the general pattern is that of increases from 1939 to 1941 or 1942, followed by decreases, and with 1944 showing gains over 1939. Table I shows the percentage change from 1939 to 1944 in output per man-hour and in unit labor costs for most of these industries.

The course of unit labor costs in the next 3 or 4 years is not clear. Output per man-hour may decline initially in those industries which have serious reconversion problems, but after a brief transition period it is widely held that industry will not only resume its prewar growth of productivity, which averaged more than 3% per year from 1924 to 1939, but will at the same time make up for any failure to meet this rate of growth during the war. Output per man-hour by 1950 may well be a third greater than in 1939.

The other component of unit labor cost is average hourly earnings. Wage rates will certainly increase in the next year, but no one can now say what the over-all rise will amount to. Furthermore, average hourly earnings will not rise in exact proportion to the increase in wage rates, for the average work week has declined in recent months and will continue to decline to about 40 hours, thereby eliminating most overtime pay. Downgrading, less premium pay for night work, and other special circumstances will also cut into average hourly earnings. But on net, average hourly earnings are likely to increase in individual industries for the next year or two. Unit labor costs will, of course, depend on the race between increasing average hourly earnings and increasing output per man-hour.

III. Wages and Materials Cost Ratios

In the preceding sections we have explored some of the basic price and unit labor costs patterns which pertain to all industry. We turn now to the cost components of some widely divergent industries. An analysis has been made for these 10 to 15 selected industries of the percentages of total value accounted for by materials, wages, and all other costs, including profits, in 1929 and 1939, based on Census of Manufactures data. "Other costs" include profits, salaries, depreciation, interest, insurance, rent, taxes, and some miscellaneous items. These industries exhibit considerable variation in the proportion of value accounted for by materials, wages and other factors.

This analysis is based on a small portion of industry and it would be dangerous to generalize from it, but for these industries, at least, it is clear that there was no general tendency for any of the three ratios to increase or decrease from 1929 to 1939. For some industries the ratio of materials to the total is higher in 1939 than in 1929, in others it is lower. The same is true of the wages and "all other" ratios.

Ratio Changes

Changes in these ratios are determined by a multitude of variables. The prices of the materials consumed, average hourly earnings, productivity, the cost of capital, etc., all enter into the picture. Some of these factors—such as depreciation and interest charges—are fairly stable. Raw materials, on the other hand, are subject to enormous price fluctuations. It is surprising, therefore, that the materials and wages ratios were as stable from 1929 to 1939 as we have found them to be for these selected industries.

Unfortunately, no census of manufactures has been taken since 1939, so that comparable data are not available for any of the war years. Projection of these ratios from 1939 to 1944 or 1945 is hazardous, and has not been undertaken in the present article. Instead, some leads will be given as to how available data may be used as rough indicators of the changes which may have occurred from 1939 to 1944. These data, which have been compiled in the U. S. Bureau of Labor Statistics, are (1) changes in the wholesale prices of the principal materials consumed in each industry (materials other than the major ones may have exhibited considerably different price patterns); (2) changes in unit labor costs (changes in average hourly earnings have been substituted when unit labor cost is not available. Average hourly earnings do not take account of changes in output per man-hour, which has probably increased somewhat on the whole since 1939); and (3) changes in the wholesale price of the finished products. A few illustrations will indicate how these data may be used. It should be stressed, however, that no inferences can be drawn from these data with respect to the profit position of each industry.

For machine tools, the wholesale prices of the principal materials increased 6% from 1939 to 1944, average hourly earnings have gone up 50%, while the price of the finished product moved up 17%. For gray-iron and semi-steel castings, the price of the principal material increased 11%, average hourly earnings went up 38%, and the finished product increased 25%. It is probable, therefore, that the percentage of total costs accounted for by wages increased in this interval, while the materials and "all other" percentages decreased. But these are industries which are characterized by heavy investment in plant, whose total cost remains relatively stable for fairly large variations in output, and whose cost per unit, therefore, tends to decrease as output increases—as it has during the war years. Important danger signals to watch in these and similar industries relate to decreases in output, which will increase unit cost because of higher overhead costs and hence the pressure for price adjustments.

Wholesale Prices

The wholesale price of shoes advanced 23% from 1939 to 1944, while the price of leather increased almost 16% and unit labor costs increased 48%. The cost of materials, the most important single component in unit value of product, has probably lost some ground to wages in relative importance. The importance of "all other" factors has probably declined, too.

While cotton narrow fabrics increased 72% in price, unit labor costs have gone up about 60% and cotton prices advanced 120%. Materials have gained as a percentage of total unit value at the expense of the other components. In this area we must watch carefully for further upward pressures in the price of cotton which may well necessitate further price adjustments.

It is likely that the shifts in relative importance of the three ratios shown in the preceding illustrations have also occurred in at least a large segment of industry. In each particular instance, the analyst should study the relative movements in the prices of the raw materials and in the labor unit costs, keeping the uncertainties that confront

Continued on page 358

THE VINYL Plastics

Tough, durable, colorful plastics whose versatility adapts them for industrial and factory products, and office, home and personal products

By GEORGE E. HENRY

Screen of Dow Chemical Company's Saran. It will not rust or rot.

THERE is wide discrepancy between baby pants and grommets, golf bags and industrial piping, window screens and fish packaging, luggage and adhesives, paper-coatings and shoe soles. Yet, these few named products are suggestive of the adaptability of the vinyl plastics for the production of a myriad of things for industrial, factory, office, home, and personal use. The answer to the $64 question—"What is the most versatile of plastics?"—undoubtedly is, "The Vinyls."

In addition to versatility, these few examples are also indicative of durability and serviceability, to which should be added color. Therefore the vinyl group deserves your interest and study, for you will hear much about them now that the War is over and the basic materials are becoming available for peacetime production.

Versatile Material

No other material, with the possible exception of caoutchouc lends itself to such a wide variety of uses, types, forms, and colors. Vinyl packaging materials are being used for wrapping and preserving uniced fresh fish in shipment from the Pacific to the Atlantic, incongruous as that may seem. During the War they were extensively used as a wrapping sheet for airplane motors and delicate instruments to protect them against dust, grime, moisture and corrosion—a task they faithfully performed.

From this group of synthetic plastics are being manufactured exquisite luggage units and ladies' handbags that are more durable and just as attractive as fine leathers. Milady may have footwear as transparent as Cinderella's glass slippers, with sturdy, clear uppers and more rugged soles—all from vinyl plastics.

The vinyls furnish paulins for covering truck shipping; tough seat coverings for subway cars, that are grease, vermin and "tough"-proof; window screens for home or summer cottage that are resistant to the elements and baseballs. They furnish colorful, durable upholstery for furniture for the home, office or institution. They supply belts and suspenders for the antithises of bobby-soxers; transparent or pastel shower curtains; tile for the kitchen, bathroom or hall; or elastic webbing for surgical uses.

Maybe your company is manufacturing such things as telescopes, or binoculars, or cameras. If so, the vinyls will come to your aid with handsome, waterproof coverings that will withstand mildew and fungi. Your plant manager may report difficulty with piping for conducting various materials that corrode and pit metals; the vinyls undoubtedly will be able to solve your problems. You may be in the market for cable and wire insulation that

Yachting costumes of Koroseal, white and cream colored.

Korogel mold for forming plaster of paris, etc.

Translucent, flexible Saran tubing. Dow Chemical Co.

may be subject to moisture, fumes, abrasion, and flames. Vinyl coverings afford the desired protection. Or it may be that your sales department seeks molded products, or products that may be die cut, that will maintain their dimensional stability in spite of service, moisture or old age. Investigate the vinyls.

And to go a little further, vinyls offer excellent adhesives for use on practically all types of materials, or for bonding glass to plastic, or plastic to metal, or woods, papers, textiles, and so on. You will find a solution for your problems amongst the vinyls.

The vinyls are the basis of both air-drying and baking type finishes, supplying coatings for beer cans, oil sumps, or refrigerator cabinets. On sheet metal, the coatings will not rupture or crack incident to spinning, drawing or stamping. Also, the vinyls may be used for impregnating cloth and paper products. Suffice it to say, they have many other uses.

Many Types Available

For industrial and commercial uses, the vinyls are available in the form of resins, rigid sheets, flexible sheets, molding compounds for extrusion or use in either injection or compression molding equipment; as elastic materials, rigid or semi-rigid moldings, filaments and fabrics; and in any color, transparent, translucent or opaque.

There are five distinctive members of this group, namely, (1) vinyl chloride acetate, (2) vinyl acetate, (3) vinyl butyrals, (4) vinyl chloride, and (5) vinylidene chloride polymers. Each of these groups has special virtues and some very special uses. It is important that you learn to discriminate between them, for as with the members of the plastics family, some have very special uses, and the tradenames, like other plastics nomenclature, are about as illuminating as they would be if spelled backward. The trade mark "Vinylite" used by Bakelite Corporation quite definitely identifies that company's group of vinyl plastics which includes several types.

Current Tradenames

Current tradenames in the vinyl group includes the following:

Saran, product of Dow Chemical Company, Midland, Mich., vinylidene chloride;

Geon, products of B. F. Goodrich Company, Chemical Division, Ohio, vinyl chloride polymers; copolymers of vinyl chloride and vinylidene chloride; and elastomers, compounds of vinyl resins and synthetic rubber.

Koroseal, finished fabricated vinyl products, B. F. Goodrich Company.

Velon, fabrics and film, vinylidene chloride, Firestone Industrial Products, Akron, Ohio.

Vinylite, tradename used by Bakelite Corporation, New York, for copolymers of vinyl chloride and vinyl acetate; vinyl acetate; vinyl butyral, and vinyl chloride.

Vinyon, staple fiber and continuous filament yarn, Carbide and Carbon Chemicals Corporation, New York.

Vinylseal, modified vinyl acetate resins for bonding impervious materials, Bakelite Corporation, New York.

Lumarith V.N., vinyl base material, Celanese Plastics Divn. of Celanese Corp. of America, New York.

Compar, polyvinyl alcohol films, Resistoflex Corporation, Belleville, N. J.

Saflex polyvinyl butyral safety glass bonding material, Monsanto Chemical Company, Springfield, Mass.

These companies have illustrated trade literature and technical bulletins describing their respective products, which it would be advisable for you to have in your plastics file, duly crossindexed.

Replace Older Materials

The Office of Price Administration, Washington, recently released the following news about price controls, which is of particular interest because it pertains to the subject of plastics:

"Handbags made of a newly developed plastic will be placed in the same category as leather handbags and will be subject to the same highest price line limitations. The new plastic is called "unsupported flexible thermoplastic material." Ordinarily it would be classified in the regulation with handbags made of other plastics and imitation leath-

Upholstery of Dow Chemical Company's Saran monofilaments, rattan type.

Koroseal grommets

Vinylite shower curtain

ers. The new material is proving to be a better substitute for leather, however, than any previously used synthetic and is more comparable to leather in cost. Consequently it is transferred from Category 8 to Category 4. The change means that manufacturers will be able to produce handbags made of this plastic in price lines as high as are permitted for leather handbags."

That plastic is one of the vinyls.

Another interesting news release pertaining to the vinyls, issued by the Department of Commerce, is about the I. G. Farbenindustrie's operations in the field of thermoplastics "which are reported by U. S. investigators as accounting for 90% of all German activities in this field." The release states that the investigation was directed mainly toward thermoplastic polymers and the raw materials from which they were prepared, and that "Polyvinyl chloride, particularly the unplasticized material is reported as having had a wide application in Germany for injection molding. In the chemical process industry it was used to replace stainless steel for piping, valves and vessels. Plasticized material reportedly was used in considerable quantities in bristles, sheets, and foil. Continuous filaments of polyvinyl chloride and the chlorinated polymer were used as a substitute for canvas for tents and other purposes."

Saran, Velon, Geon

The vinylidene chlorides hold particular interest because of their unusual qualities and diversity of uses. You will find this material and products made thereof widely exploited under the tradenames Saran, Velon, and Geon.

Saran products include fine fibers, heavy duty extruded pipe, tubing, small molded vials and ladles, electroplating masks, colorful monofilaments for upholstery, and moistureproof wrapping films. Among the outstanding characteristics of the vinylidene chlorides are resistance to chemicals and solvents; their very low water absorption rate; their non-flammability, and their non-aging qualities. They are used in diversified industries, such as footwear, petroleum, chemical and pharmaceutical, aircraft, textile and packaging.

Saran products include valve seats, ball checks, medical probes, gaskets, tape and joint wrappings, filaments for heavy duty upholstery and for fine fabrics and screening. Dow claims that its Saran pipe is the first practical thermoplastic pipe. It is produced in sizes from ½" through 4", O.D. In weight it is approximately one quarter the weight of comparable sizes of iron pipe.

This pipe is being used in petroleum and chemical plants, and for disposal lines to carry off waste corrosive acids. In the electrical power field it is being employed on heat exchangers and rectifying units. Pickling solutions have no effect on it. The tubing has similar acid and chemical resistant qualities.

Of particular value is the fact that the pipe can be threaded with standard pipe threading tools. It is easily welded on the job, welded elbows for instance being made by cutting on a 45 degree angle and butt welded on a hot plate. Standard pipe fittings also are available. Bursting pressure of the ½" pipe is 1300 lbs. psi and working pressure 260 lbs. psi, while for the 4" pipe, the figures are 460 lbs. psi and 90 lbs. psi, respectively.

Molded products of vinylidene chloride have good electrical qualities, and readily lend themselves to machining. Saran has a tensile strength of 40,000 lbs. psi.

The vinylidene-chloride fabrics are available in as many colors as glorified the famed coat of Joseph. Moreover, they are featured by non-soiling properties and high resistance to most acids, alkalis and other solvents, along with the desired qualities of toughness and abrasion resistance. The fabrics are immune to the greases and dirt that ruin ordinary fabrics, and to sunlight. Cleaning is merely a matter of using plain soap and water or other standard cleaners to restore the natural beauty of the materials.

These synthetic materials are proof against termites as well as other vermin.

Physical Properties

Bakelite's Vinylite plastics group reveals that it has a multitude of use values, with the complement of an unlimited color range. There are four types in the Vinylite plastics

Vinyon chemical and acid resistant shirt for use in chemical and other industries.

Fine furniture with Koroseal upholstery and suspension system of latticed straps of Koroseal.

Suitcase covered with vinylite plastic sheet after 5 years' of service.

group, namely, vinyl chloride-acetate, polyvinyl butryals, polyvinyl chlorides, and polyvinyl acetates.

The first of them, vinylchloride-acetate, when modified with fillers, plasticizers and pigments or dyes is made into rigid sheets, flexible sheeting and film, textile fibers, and molded or extruded articles. It may also be dissolved in organic solvents to produce tough, chemically resistant surface coatings. The unplasticized rigid sheets have low water absorption, are dimensionally stable, and will not warp or shrink under varying atmospheric conditions, are non-flamable, strong and tough, odorless, tasteless and non-toxic.

Rigid sheet material is available in a wide variety of transparent, translucent and opaque colors in thicknesses ranging from .005 to .250 inches in press-polished or matte finished surfaces.

For fabrication, this rigid sheet material be formed and shaped under heat, and when heated can be drawn to a depth of two or three times the size of the blanked piece. The sheets may be blown, spun, swaged, or formed around a mandrel into complicated three dimensional shapes. They lend themselves to machining operations and may be punched, sawn or sheared. Also, they will take printing in four or more colors.

The flexible sheeting and film are tough and highly resistant to tearing, abrasion, and scuffing. These sheets may be stretched to as much as three times their original length without cracking or creasing. Mold and mildew will not affect this material, and it will resist water, oils, grease, alcohols and many corrosive chemicals.

The flexible films are used in making wearing apparel items, pouches, shower curtains, raincoats, umbrellas and other articles. Backed with coutil cloth, the material is used for shoe tips and foxing; unbacked, it may be used for making transparent uppers in women's shoes.

Vinylite molding and extrusion compounds are featured by chemical and physical qualities similar to those previously mentioned. They are available in unlimited color range in rods, tubes and extruded shapes, and may be injection molded.

Flexible Compounds

By the use of plasticizers, flexible molding and extrusion compounds are produced. The flexibility varies from semi-rigid to soft rubbery types. The compounds may be injection or compression molded. The elastomeric compounds may be extruded around wire or cable to provide electrical insulation which is non-flammable, non-oxidizing, and resistant to oils and water.

There are special Vinylite copolymer resins, including laminating film, which may be applied as a protective and decorative film to varied types of surfaces, and to resin-coated paper. The latter is inert. It has high chemical and moisture resistance, and is used as closure liners for packaging food, beverages and pharmaceutical products.

Another member of the group is Vinyon fiber which is available in all standard deniers in the stretched and unstretched forms. The yarn and fabrics are chemically inert, permanently water resistant and mildew proof. They are used for industrial fabrics such as filtering cloths, pressed felts, sewing threads and twines of varying construction. Listed potential uses include knitted and woven goods such as chemical workers' clothing, raincoats, sporting goods, sails, fish nets, tents and awnings, shower curtains, umbrella fabrics, and full fashioned hosiery. When the fiber is used in a mixture with cotton or wool, the resulting fabric will maintain a crease or fold.

The polyvinyl butyral resins are primarily used as the interlayer material in high test safety glass. Besides this usage, the resins are employed as coatings and adhesives.

Vinylite polyvinyl acetate resins among other things are used as leather finishes, and textile, felt and straw sizes. They are used extensively as adhesives. Bakelite's adhesives of this material bear the tradename Vinylseal.

Flexible and Luminescent

There is another material in the Vinylite plastics group. It is the polyvinyl chloride resin. It is principally used for flexible tubings, extruded cable coatings, and for gaskets and washers. Fabrics for raincoats and other waterproof articles may be impregnated with this material.

Saran clothesline made of Dow Chemical Company's Saran monofilaments.

Saran pipe fittings threaded according to American Standard Pipe Thread specifications Dow Chemical Company

Lightweight Koroseal golf bag

Among the newer developments in the Vinylite plastics are luminescent materials of the phosphorescent and the fluorescent types. The phosphorescent type will glow in the dark for a period varying from 30 minutes to two hours when zinc and cadmium sulphides are used, and from ten to twelve hours after exposure to light when calcium and strontium sulfides are employed. The fluorescent pigments have no afterglow, luminescence being developed by "black" light lamps.

The Geons

Another group of vinyl plastics are the Geon products, polyvinyl resins developed by the Chemicals Division of the B. F. Goodrich Company. There are four specific resins of two chemical types, namely, the Geon 100 series, polymers of vinyl chlorides, and the Geon 200 series, copolymers of vinyl chloride and vinylidene chloride.

Outstanding among the properties of the Geon resins, as with those previously mentioned, are their unusual chemical inertness and resistance to corrosion. By proper formulation, the resins can be modified to produce compositions varying in properties from those of rigid thermoplastic, through an elastomeric range to a very soft jelly. When compounded with other materials they can be processed in many ways, including injection and compression molding, extruding, calendering, solution coating and film coating.

The various compositions exhibit to a high degree the desirable characteristic of the base resin used. Among the outstanding qualities of plastics made with these resins are the remarkable combinations of rubber-like properties with nonflammability and resistance to oxidation. Compositions made from the Geon 100 series are characterized by their resistance to deformation at elevated temperatures in comparison with other vinyl thermoplastics.

By compounding plasticized vinyl chloride resins with certain butadiene type synthetic rubbers, Goodrich has perfected vulcanizable blends which are said to possess most of the best properties of each material, creating a practical series of elastomers.

These elastomers are compounds of the Geon vinyl resins and Hycar oil resistant synthetic rubber. Vulcanizable blends are processable by well known rubber industry techniques. Compositions made from the blends can be extruded, molded, calendered, or spread, and if desired a mirror-like finish can be produced.

Better Than Rubber

Properties possessed by the combination of the two materials, which are said to be better than when the oil resistant rubber is used alone, are extreme resistance to the effects of sunlight and ozone, increased resistance to benzene and similar aromatic solvents, both in swelling and cracking, low temperature flexibility combined with excellent heat resistance, improved flexing life, tear resistance, resilience and even aging.

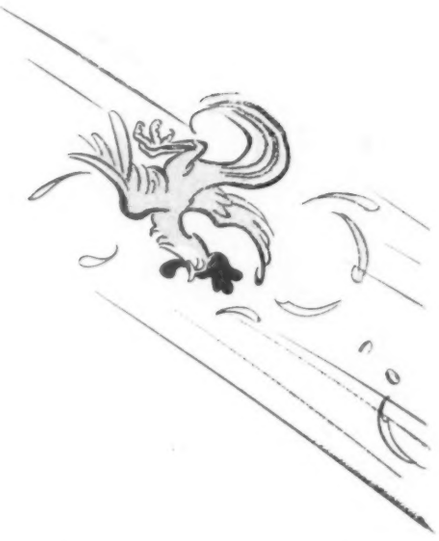
The uses for this material are quite ramified. They are said to give unusual advantages as wire and cable jackets, shoe soling, hose covers where resistance to sunlight, solvents, oils, chemicals and heat is needed; extruded and molded parts in which resistance to sunlight, ozone, solvents, heat and cold is vital; grommets, seals; insulation and cushioning pads; plating rack and tank linings where they resist the actions of corrosives and heat.

Non-vulcanizable blends of Geon resins and Hycar can be used in surgical and hospital goods such as plasma tubing, sheeting, and other products where repeated sterilizations and contact with solvents must be withstood.

Now, a note of warning: There are, as has been emphasized, several different types of vinyl plastics. All do not have identical chemical, physical, fireproof, and heat resisting qualities. For instance, certain products have been put on the market in which wrong grades were used, and even reprocessed materials utterly unadapted for the end use of the product. These things mean product failure.

Because of the technical factors involved it is the part of wisdom to consult with manufacturers before making selection of vinyl base materials (any plastic for that matter), for any product for which they may be considered.

KIDDING OURSELVES ALONG



There are three kinds of conscience: the national conscience, which nobody understands; individual conscience, of which there are as many varieties as there are people; and the sort of conscience that a purchasing agent must have to do his job

By CHARLES FORD

ONCE upon a time there was a paper manufacturer, operating a good-sized mill, whose way of doing things was anything but conventional. He didn't want all the business there was; he was perfectly satisfied to make what good paper his capacity would permit, and he'd be teetoally damned if he'd make any other kind. If you wanted what he could produce according to his own ideas, you were welcome and he'd give you the best he had. If you wanted something a little below par, you were politely but firmly told where you could go. Nevertheless, he ran his mill profitably for a long period without even a salesman, which is something. He was both honest and honorable, which ain't necessarily the same thing.

Breaking a Bargain

During one of the recurrent periods of slack water in the paper business, he decided to put in another paper machine, which, as far as investment is concerned, ain't hay. He had his own ideas about paper machines. Instead of sending out carbon copies of his specifications to everybody who owned a power hack-saw, he stuck the specifications in his inside pocket and went to a builder of machinery whom he knew and trusted, laid the details before him, got an estimate, and placed the order.

In due time the machine was completed and set up, with all the appurtenances thereto. The damned thing ran right the first time, which doesn't always happen, especially in paper machines. About a week later the paper maker appeared in the machine man's office and laid down, on the barrel-head provided for such occasions, a check made out for the agreed price, plus ten percent.

"Here," protested the man of machinery. "This ain't right. I agreed on a price and it goes."

"So do you," said the paper man, "—to hell. When you took this order you were so hard up for business you figured it down to the last buffalo nickel to keep your confounded shop running. You've given me a good machine and you haven't made a damn' cent on it; maybe you're not even with the game. I'm not letting anybody lose money on me for as good a job as you've done, so you take this check and like it."

I consider that a nice instance of a couple of gentlemen doing business together on the right plane for doing business. No kidding nor finagling—just plain honest-to-gosh mutual trust and consideration. Twenty years after the transaction the machinery man told me the story; the paper maker, whom I knew well, never mentioned it.

Dollars and Sense

I suppose a mere purchasing agent who did such a thing would have to quail before the tomahawk and scalping-knife of his boss, and lucky if he didn't get booted out of the shanty. But here and there we hear of cases where such handling of transactions is eminently fitting and proper. When a purchasing agent runs into one, he should act his age, and to the devil with the boss. If a man is big and broad enough to hold down a first-class purchasing job, he is big and broad enough to be allowed to set or release the brakes, according to the road.

The Morning After

We are just now witnessing the humbling and surrender of a brace of stinking and arrogant world-pirates, who went the limit in prostituting national decency. They asked for a high-power shellacking, and, by gravy, they got it. Some of our own skin, hair and toenails were sacrificed, worse luck, but we licked 'em. Just now they are humble enough, but who really knows how much a skunk repents of his skunkery? These animals rate a million years in the international hoosegow, and no time off for good behavior. Perhaps the Gilbert & Sullivan formula—something lingering, with boiling oil or melted lead in it—would be the answer; but, the devil of it is, we can't leave international running ulcers unsterilized in this world of ours.

It might affect our standard of living.

But just what do we mean by this pet phrase—our standard of living? I don't think any of us know. It may mean different things to different people. However, it seems to be

mixed up with unlimited gasoline, unlimited rum, and unlimited refrigerators to hold the rum and its concomitants. It might mean a new car every year and license to hell along all roads at fifty to a hundred miles an hour, drunk or sober. It means big pay for little work, office hours from twelve to one with an hour for lunch, comic strips in the newspapers which are no laughing matter; couples living in two-room apartments and both working to get more money to buy more gas and more gin, and to hell with posterity.

Who thinks about the cold gray dawn of the morning after?

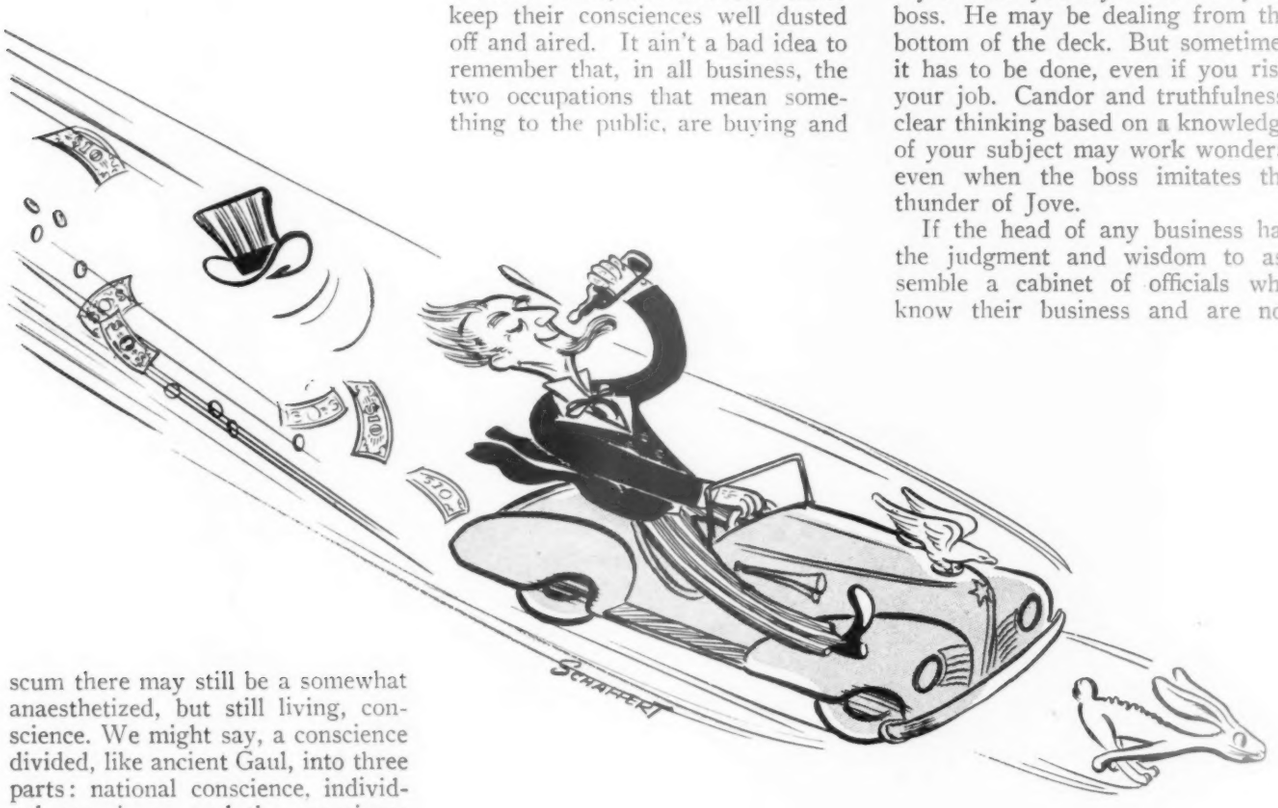
True, all these things may be merely the germ-laden scum on the surface of society; underneath the scum there may still be a somewhat anaesthetized, but still living, conscience. We might say, a conscience divided, like ancient Gaul, into three parts: national conscience, individual conscience, and the conscience of the purchasing agent. The last, notwithstanding the sardonic dictum of the guy who said there are liars, damned liars, and purchasing agents.

A Matter of Conscience

National conscience is something we brag about, even if we don't know what it is, or where. We keep on passing legislation intended to divert government money to the pockets of those who do nothing to earn it; else why the fictitious price of silver, cotton, wheat and other things? Why the domination of decent workers by so-called labor leaders, aided and abetted by our Washington wise-acres?

National conscience can be but a multiple of individual conscience. If every guy keeps his own henhouse clean and skunk-tight, the national poultry-yard may not be such a happy hunting ground for the silent, but odorous polecat. In making up our minds that if it's in the newspaper headlines it must be so, we are likely to forget that editors, reporters and copy-readers are just another set of human beings, shackled by the necessity of selling their papers. We are too confused by clamor to think straight, so we kid ourselves along as best we can.

Strangely enough, purchasing agents, like some others, are more or less human; it's hard for them to keep their consciences well dusted off and aired. It ain't a bad idea to remember that, in all business, the two occupations that mean something to the public, are buying and selling. By them is business judged. The salesman's creed is simple: get the orders. But the purchasing deals in everything, from hair-pins to hydro-electric plants, and sometimes he has to move pretty quickly on his hinges to adjust from one to the other.



Face the Facts

The purchasing agent is the last man in business who can afford to kid himself along. He must face facts as they stand, without paint or whitewash. Wishful thinking and purchasing are bad partners. If a market shows signs of cutting capers, what is behind it all? Will it lie down and be good, and when? Or will it fall out from under you when you least expect it? Clear thinking and the habit of facing facts: the purchasing agent with these faculties isn't apt to get lost in the woods. And the purchasing agent who lets his boss do the thinking for him may find himself up Salt Creek without a paddle. The boss often mistakes authority for infallibility. Often the horizon of a boss is limited by the view from the opposite side of his banker's desk; the purchasing agent's horizon is what he makes it.

You have set yourself a hell of a job when you try to reform your boss. He may be dealing from the bottom of the deck. But sometimes it has to be done, even if you risk your job. Candor and truthfulness, clear thinking based on a knowledge of your subject may work wonders, even when the boss imitates the thunder of Jove.

If the head of any business has the judgment and wisdom to assemble a cabinet of officials who know their business and are not scared to say what they think, and who will kid neither their boss nor themselves, the business isn't going very far astray at any time. The boss may give all needed attention to his fishing tackle.

Boss or purchasing agent, he who kids himself is a gone gosling.

FOOD AND FUEL

Britain's supply problem is primarily concerned with the elemental needs of mankind — food, warmth, and power

●

By WAYNE ALLEN

Brigadier General, Army of the United States, formerly General Purchasing Agent, United States Forces, European Theater

THE lights went on in London some six months ago. I was there on that great day and helped in the celebration for I had lived off and on in London for over three years and had groped my way around through the fogs in those dark, dread days of the German bombings and know how the people thought—no more air raids, no more bombs—lights! And with light—travel—buses, trams and public conveyances operating at night with lights. It was a joyous feeling.

And with lights, and the ability then to travel more expeditiously than before, came the opportunity of the British Purchasing Officials' Association to hold a national "meeting", not a convention or a conference, but a meeting, and I flew over from the Continent not only to attend, but to make one of the informal talks at the meeting.

It was then that I saw London again—but a dimmer London than just after V-E Day. The lights were *not* so bright, for Engalnd, the land of coal, is short of coal. All power in England is generated by steam and as the coal shortage becomes more acute the more necessary it is to conserve on public lighting.

Two Basic Worries

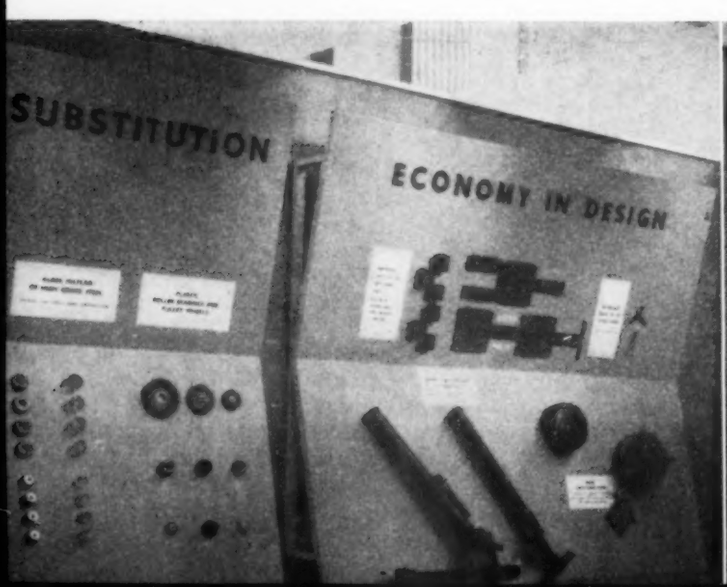
Many things worry these Purchasing Agents in Great Britain—the members of the British Purchasing Officers' Association — besides strikes and the time that it takes to reconvert from war production to production for their normal needs and for that export trade which Britain must have in order to eat. One worry *may* be that five billion dollar loan they expect to get from Uncle Sam to help finance their reconversion program, but that is far from being the principal worry. They have two primary or principal worries which affect them both as Purchasing Agents and as individuals. This coal business is one, perhaps the most important, and the other is that of food—food for their employees—food for themselves.

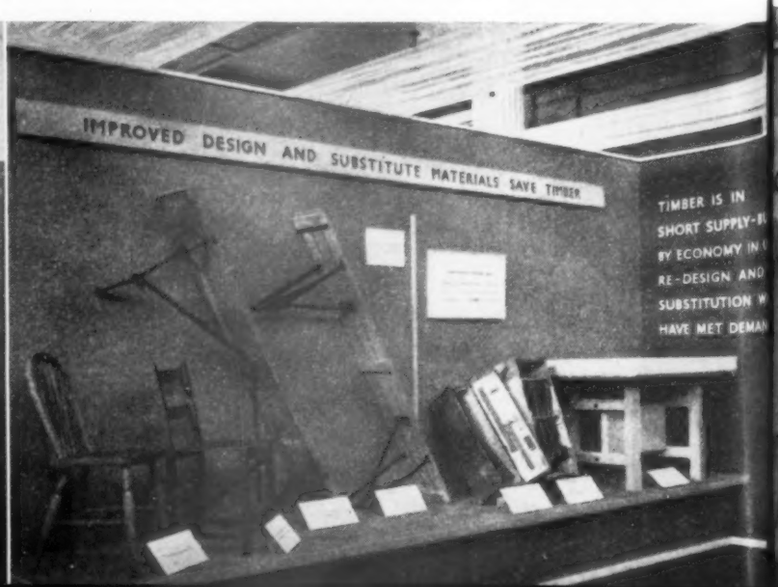
Great Britain, with its 88,745 square miles of area, much of which is moor or waste land, or, as in Scotland, mountain crag or lake country, has to support more than 45,000,000 people. It must import most of its food.

But during the war, it found that it *had* to produce a much larger percentage of its own food than ever before. Manufacturing concerns found that to maintain any continuity of employment without a great percentage of abseenteeism they must feed employees a noon meal. This put even the industrial Purchasing Agent in Britain in the food production business. Wherever any corporation had any vacant land at all it was planted. Even the flower gardens in front of the management offices were converted into potato or brussels sprouts or cabbage beds.

Britain obtained from the United States on Lend Lease during the past two years over 160,000,000 pounds of vegetable and field seeds!

Britain made an outstanding record in conservation during wartime;





During the war Britain converted nearly eight million acres of lands from fields or woods into production of grain or vegetables, a 66% increase over the pre-war acreage devoted to planting.

Much of the production is done by volunteer workers—volunteers from the various industrial works and volunteers from the cities.

The volunteer for harvesting has done much. These volunteers take their "holidays" or vacations in the country during the harvest period, and have been quite a factor in the harvesting of these greatly increased quantities.

The soldier was greatly responsible for increased production — American as well as British. This may appear strange—a soldier working at agriculture. However, the gardening was done in spare hours, that is, after normal duties or drills. The British Army had an extensive agricultural program under way when our soldiers first arrived in Britain; and, immediately recognizing the value of such an enterprise, our Army developed a joint program. It really was "joint" in every sense, for the American soldier worked side by side with the British soldier. During our stay in England an American unit moved to a station formerly occupied by an English unit and took over where the Tommies left off—and *vice versa*.

One reason behind this joint program was the fact that if we brought over our own farming machinery it would have required as much shipping space as a year's supply of food for our Army at that time. Therefore, the British Army agreed to let us use their equipment. For instance, in 1943 American soldiers in Britain produced 122,400 tons of fruit and vegetables and 7,200 tons of cereals, which went a long way toward feeding ourselves in those tight little islands.

The Britisher gets no more food now than he did during the war, and that was little as compared to the United States standard of living. So it is little wonder that much concern is exercised over this item.

Fuel Production Off

The second item of worry — it could easily be called the first — is that of fuel. For here again the Purchasing Agent is concerned for his own factory or institution and also for his own home. This is going to be a cold winter in England, for coal is rationed to the home consumer, as well as to hotels, apartments, etc. England, the great exporter of coal, will export none this winter. The reason: lessened production. The England which dominated the world through its industries based on the ready availability of coal, the England which obtained so much wealth from the Scandinavian countries, Portugal, Spain, and even France through export of coal has not enough coal to maintain itself! Yet such is the situation today. There are many reasons why there is a coal shortage.

A number of things need to be said: the shortage is only a matter of lack of production—the coal is there. And the lack of production concerns every bit of the economy of Britain—not just the warmth of the home of the Englishman, but to a very great extent, commercial relations with the countries which have looked to England for fuel.

In Portugal the power is made no longer from English coal, but from wood out of the pine forests of Portugal itself. The railroad trains are now burning wood! Square mile by square mile, the forests of Portugal, of Norway and Sweden, are burning out to provide power—motive power for railways and for home warmth. And as fast as forests are consumed in lieu of fuel, there is that much less timber or lumber for Europe and for England!

The British Purchasing Agent sees greatly increased prices for all timber products and increased prices of all paper products because of this fall-off in mining of coal in Britain.

So the lights are dimmed in Britain just as they are dimmed in other European countries.

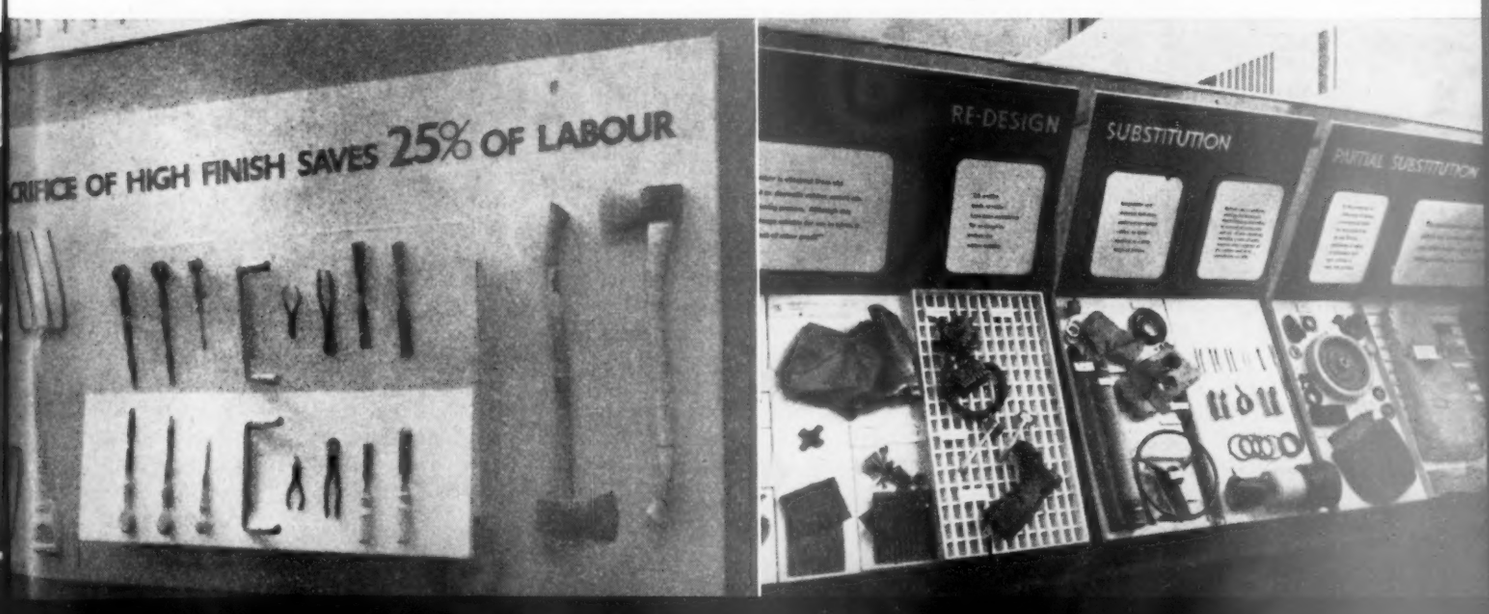
It is a worry to the individual as well as a worry to the Purchasing Agent and probably anyone's prediction as to the duration of such an economic situation would be correct.

That condition is one which will affect us all. Don't be mistaken about that. We might isolate ourselves from a military point of view but never from an economic point of view. We have been and are now shipping coal to Europe and in substantial quantities.

British P A's Seek Affiliation

The Purchasing Agents in Britain are coznizant of the world-wide turmoil in economic conditions. Not as well organized as their American cousins, they requested in that meeting in November that I mention their desire to affiliate with the National Association of Purchasing Agents in America so that they might have the advantage of ascertaining first-hand the information which our Association accumulates. It might be to our advantage to have an exchange of information from those tight little islands.

now the basic needs of food and fuel pose a difficult problem



HOW TO DETERMINE THE Right Price

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Price analysis is an essential part of doing an efficient purchasing job

DURING the war, the armed services conducted an extremely successful campaign in the field of price analysis. Their excellent record was the result of constant application of standard pricing techniques modified in many respects by unique and effective features. Such proven methods should be applicable, to a considerable extent, to commercial purchasing practices, and it is in this vein that the subject is treated herein.

Price is the amount of money fixed as the consideration for any article a buyer may purchase. For the purpose of this discussion, it will be assumed that quality and service are suitable and that the only consideration is one of price.

Price analysis or pricing means the collection, interpretation and effective utilization of price information for the determination and negotiation of a reasonable price for use in a proposed contract. It will be recognized, of course, that the degree to which the use of pricing methods is justified will depend upon the importance of the commodity to the buyer's company and also upon the size and completeness of the purchasing staff. Emergency supplies, repair parts, and items of small value that are purchased regularly are best procured by depending on the integrity of selected suppliers.

Although a negotiation may degenerate into a "dicker" or "horse-trade", fundamentally it is an orderly procedure which involves discussions between buyer and seller to evaluate correctly, from an analysis of all determinable factors, the object of sale, with a view to setting a price agreeable to the buyer that will fairly compensate the seller.

The following five specific techniques are used in negotiating reasonable prices:

Price Factors
Economic Conditions
Comparative Prices
Cost Analysis
Contract Provisions

The buyer's analysis of price must necessarily take all of these factors into account in arriving at his decision of what constitutes the right price. To some extent the techniques used will vary according to the manner in which the purchaser obtains price information on the particular commodity. From this point of view, commodities may be classified as follows:

Commodities sold on market quotations published in trade papers, such as raw materials.

Commodities sold on vendor's catalogs and discount sheets, such as mill supplies and other standard items.

Commodities sold only on quoted prices, such as machine tools and special parts.

It is the responsibility of the officer who is spending company money to obtain value for the company dollar. The use of price analysis may be expected to accomplish three things:

It will save money for the buyer by serving as the basis for avoiding unnecessarily high prices;

It will assist the buyer to protect valuable sources of supply by assuring a fair profit to the supplier; and

It will perform a service to society in general by conserving materials and labor, by reducing costs and prices and limiting inflation.

Price Factors

Proper evaluation of price factors such as material standardization; quantity; delivery schedules; f. o. b. point; packaging; financing provisions; and royalties. The contractor should be given every opportunity to present suggestions covering price factors, which will improve contractural and production relationship.

Material Standardization: The most important source of price reductions, though the most difficult to achieve, is the elimination of qualities or characteristics that are not essential to the uses to which the commodities are to be put. The suitability of an article for the service required is very important; otherwise, money would be wasted in the purchase of a quality better than needed, and economic losses would result from the use of cheap but low-grade products.

Material standardization affects a reduction of direct and indirect costs. To illustrate its economic importance to management, it is estimated that a minimum of 10% direct saving on the purchases of any item investigated is possible. Specifications are drawn so as to eliminate every item of expense that

does not add to the real service of the product. Simplification eliminates numerous and sometimes unsuitable variations of grades and sizes of material, aiding the consolidation of purchases and volume buying, thus decreasing quantity and cutting extras and buying from warehouses which necessarily must add an additional handling charge. The use of nationally recognized standard materials reduces cost because these materials can be manufactured in the largest quantities resulting in decreased unit cost and increased uniformity in output which in turn contributes to economies in the buyers production.

Quantity: Increase in volume often permits the purchase of materials on the basis of lower-cost-specifications which are not procurable in smaller quantities.

Quantity buying increases vendor production and transportation loads with consequent reduction in contractor and carrier costs. The larger the quantity, the more complete should be the contractor's factory operation, with substantial savings in the costs of materials and labor as well as unit overhead. With constant repetition of a given operation, manufacturing methods are improved and the workman requires increasing skill and speed. The effect is most striking in the production of new supplies. The contractor's material costs decrease with increase in volume of production due to quantity discounts, lower freight rates and possible use of lower-cost-specifications. Unit overhead should tend down an increasing volume and larger work week, because it consists of charges which are relatively fixed.

The effects of volume in costs will depend upon the variety of the items going through any given plant. The manufacturer who has the largest volume of production of substantially the same items should be able to quote the lowest price.

Exceptions to the general rule that price should decrease with increasing quantity appear due to overloading when the volume in a plant reaches the point of diminishing returns and in the placing of research contracts. In general, division of labor can be carried down to certain fundamental operations beyond which it is difficult, if not impossible, to go, no matter what the quantity may be, and there is always a possibility that the point of greatest economy may be reached before subdivision into lowest fundamentals is reached. It should be noted that as division of labor is extended, coordinate measures must accompany such extension in the way of engineering, production planning, clerical supervision and careful inspection. All of these measures cost money and tend to offset gain from division of labor.

In placing a research contract, the project should be broken down as much as possible. As the contractor proceeds, he obtains more and more information about the job and what is required and therefore is better able to give accurate estimates as to what the prices should be.

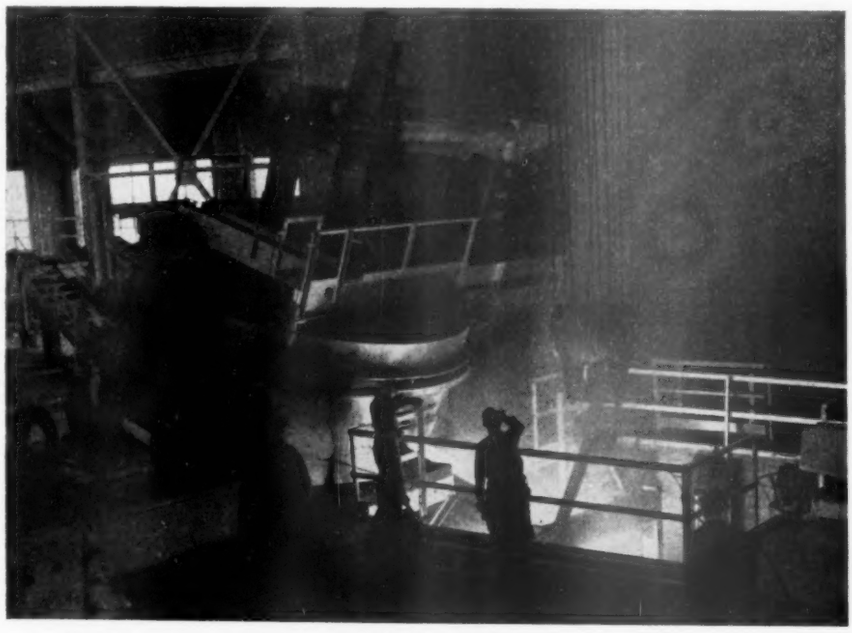
In buying small quantities, the buyer as far as possible should group these purchases into orders large enough to obtain price consideration.

Delivery Schedule: A schedule which builds up volume gradually will lead to lower production costs than one which compels a manufacturer to increase his volume sharply in a short period of time. Orders can be filled quickly only by working men overtime and possibly by postponing other work—at the risk, of course, of offending the customer whose goods are delayed. Also early scheduling of requirements may necessitate uneconomical purchase of materials, bonuses to suppliers and extra procurement costs such as follow-up. For doing this, producers naturally require a higher price. As quantity increases, the price necessary to induce immediate delivery rises rapidly. This, of course, does not apply to a contractor who is constantly producing large quantities of the item.

It should also be realized that the contract price of an item which is to be delivered during a relatively long period of time may, because of the risks imposed by the time factor, be higher than the price of a contract which calls for delivery over a short period. As pointed out in a later section, the influence of such risks on prices may be affected by contract provisions for shifting the risks to the buyer.

Other Factors: Another factor is the f.o.b. point. The delivered price should be checked with the traffic rate plus the shipping point price. It is particularly worth while to explore with the contractor the extent of a delivery-zone price. Commodities that are delivery-zone priced oftentimes may be purchased more economically f.o.b. shipping point paying the freight charge.

Due regard must be given to method of delivery (e.g. tailboard delivery, actual unloading or stacked delivery) which affect price at once. In the case of truck delivery of sand, coal or ready-mixed concrete, an average unloading time agreement with the supplier should embrace credits and penalties. Otherwise, unloading time charges and equipment use costs are improperly reflected in the purchase price.



On major raw materials, standard market costs are readily available

Many items of procurement involve the use of processes or devices which are subject to patent rights. Some contracts may contain higher prices to make allowances for royalties to the patent-holder. The inclusion of royalties should be subject to critical scrutiny in each case.

Some purchase agreements provide for specific guarantees of performance by the contractor. A contractor's guarantee which depends upon his own manufacturing skill may call for a higher price. When the contractor makes substantial provisions for guarantee expenses in his contract price, the basis for his estimated costs should be reviewed.

Economic Conditions

Price, to a great extent, is determined by economic conditions over which neither the buyer nor the seller exercises direct control. These economic forces are fundamental in their character: quantity of money and credit, the volume of business, taxes, tariffs, strikes, freight embargoes and other disturbances. The economic concept of price is embodied in the law of supply and demand. If supply overreaches the demand, price will be lowered; while if the demand is excessive, the price will rise. Over a period of time business conditions and therefore prices will trace an undulating curve.

A problem of importance in buying is proper timing of purchases to secure the greatest possible advantage from market movements. Other factors being equal, during the period of advancing prices, purchases are made in larger quantities for coverage farther in advance; during the price decline, purchases are more closely geared to immediate requirements and the "hand-to-mouth" policy prevails.

The necessity for knowledge of market trends and their causes therefore are essential. The price movements are detailed by purchasers on charts and graphs in relation to production, consumption and other pertinent factors which affect the price. Items of market information are ordinarily available in such publications as trade papers, financial publications and daily newspapers. Contacts with vendors' representatives furnish another important source of price information in the form of advance "tips" regarding changes in price or in concessions offered.

Comparative Prices

In obtaining the best prices there must be mutual confidence between purchaser and vendor. Sales representatives are excellent sources of information as to price trends, contemplated revisions, and vendors' price policies. It is highly desirable that purchasers should choose to stay with vendors' who have proved that they have the intent to give the buyer the best prices. However, there is no excuse for a purchasing department to place itself wholly at the mercy of a vendor as to prices without proper means of checking them.

The use of comparative prices and comparative price trends is a well known pricing technique. Purchasing offices wherever possible follow the policy of purchasing from two or more approved sellers of a given material. It may be desirable on the initial order to buy the brand specified by the requisitioning department to save time. But no buyer should be satisfied until he has found an alternative source, no matter how satisfactory his original source of supply may seem. It is the basic principle of purchasing that competition reacts to the benefit of the purchaser for among other reasons he is put at an advantage in bargaining and obtaining lower prices.

No contractor derives satisfaction from being the highest price producer, and many will reduce prices simply to meet the lower price of another. Many corporations recognize that close prices help greatly in developing increased efficiency in production and for this reason will accept a competitive price reduction.

Even on many items which are catalogued and on which standard price lists are issued, the price lists are not a safe indication of current prices obtainable. In some lines, confidential extras, preferred discounts or price concessions, especially based upon quantity, are found to exist. Extras or discounts of this type may be obtained by the purchaser through having the confidence of his suppliers and through constant exploration of truly competitive channels.

Price comparisons may be made:

Between different contractors;

Of somewhat similar items; and

Comparison of individual prices with general price indices.

Care must be taken to make an engineering and business evaluation of the differences in the proposal to improve the validity of the price comparison.

Inquiries should not be sent to a source of supply to whom the purchaser would be unwilling to give the order. Quotations should be held as confidential by buyers. Hinting to competitors of a bidder as to nature of quotations destroys bona-fide competition.

Comparative Price Trends: Another useful method is to compare the price changes of one contractor with those of another for the same or a similar item. Thus even though prices are at different levels, experience in manufacturing should result in price reductions or increases by all contractors and the rate change should be similar. Quoted prices are also studied in relation to the

The vendor's costs and accounting methods are also a concern of the buyer

last price paid, changes in volume, cost of raw material, labor, etc. It can be generally assumed that the price for an extension of an old contract should be higher than the price under which deliveries are originally made. In many instances, improved manufacturing technique or increased volume will require that the new price be lower.

Essential is an accurate record of past purchases, giving the prices paid, quantities ordered, and marked values of the major commodities entering into the item at the time of each past transaction.

Cost Analysis

Comparative prices are not necessarily close prices. Therefore, an analysis of the cost elements (materials, labor and overhead) of the price should not be overlooked just because competitive comparisons can be made. In single facility negotiation, cost analysis must be relied upon almost entirely in order to understand a price and as the negotiating tool. Unless a buyer has some idea of his suppliers' costs, he is not in a position to judge the reasonableness of prices which he is paying.

The term cost includes total expenditures incurred for the acquisition of items to be sold or services to be rendered. The analysis of cost components must center upon the major factors affecting price. Some of the most productive methods of analyzing total costs is to compare the estimated cost breakdown with a breakdown of costs incurred in the manufacture of the item during prior production periods, with cost breakdowns submitted by other bidders, and with overall income statements.

Prices Below Cost: In the long run, prices gravitate toward the cost of production, including the return necessary to attract capital into the industry. However, it is not implied that prices are to be based solely on the total of costs plus a profit. It is recognized that business costs are characteristically speculative. In a competitive market, prices do not depend on any one manufacturer's costs, but on the general interaction of supply and demand, and the necessities and costs of the marginal buyer or seller who will enter or withdraw from the market with any price change. Once goods have been made, there is nothing to do but sell them, sooner or later, for what they will bring, and this price may not cover the cost of production.

It may be profitable for a contractor to take business at less than its cost, provided it returns a worthwhile margin above out-of-pocket costs and utilizes otherwise wasted capacity. In pricing some articles, it is common to have one price for the larger users who are themselves able to produce the commodity. This lower price may represent less than the cost to the producer were these sales to bear a proportionate share of the cost of equipment and overhead, but it is above the out-of-pocket cost. Such pricing may benefit all parties. Presumably the contractor is able to offer better service because of the marginal revenue from the larger user, which would not otherwise be obtainable.

The complete adaptation of the government's method of cost analysis to industrial price procedure is not likely since it involves the right of a buyer to audit and even to define a producers cost (First War Powers Oct. 1941 (Public 354, 77th Congress). Lacking the privilege of audit, it is not possible always for the commercial buyer to acquire cost information. In practice, cost breakdowns that are available are often reliable. Even though the cost information is sparse or inaccurate, it may always be used as a basis for a series of questions which might prove enlightening. Sources of cost information open to an industrial buyer are as follows:

a. Estimated costs and other relevant data from contractor's proposal forms and through contacts with the

ESTIMATING MACHINING TIME

A. *Set-up Time.* Study drawings, collect and arrange necessary tools and work holding devices, set up machine for the specific operation.

Set-up time is the same whether one piece or several are to be machined. It is seldom considered in continuous production because it is spread over so many pieces that it practically disappears.

B. *Machining Time.* Time required for machine to remove the given amount of material. This depends on the speeds and feeds employed, and can be calculated almost exactly.

C. *Handling Time.* Time required to lay out work, set it on machine, locate cutting tools in relation to work, measuring, burring, and removing each piece that is processed.

Handling time depends on size and shape of part, accuracy required, and nature of work holding equipment available. It may vary from seconds on large quantity production and elementary operations to hours on special and complicated jobs. On standard operations, handling time approaches a constant that may be estimated by study of previous records. Otherwise it must be established by experience. On repetitive operations, unit handling time may be reduced by as much as 50% through operator's familiarity with the process.

D. *Maintenance Time.* Re-sharpening and re-setting tools, and other incidental non-productive time. Varies from 10% to 25% of total unit time for A, B, and C. Depends on nature of the operation, accuracy required, and simplicity of the cutting tools.

E. *Making an Estimate.* In general machine work, the usual relation between actual machining time and total time is about 1 to 4. A rough estimate can be made by calculating machining time only, multiplying by 4, and adding 10% for contingencies, scrap, etc. An exception must be made when work includes both machining and assembly of a complete mechanism. Assembly time is practically all handling time, which is the most difficult to estimate accurately in detail.

contractor's salesmen and executives.

b. Actual costs of contractor based upon current or prior production experience as a result of a request on the contractor.

c. Financial statements may furnish useful cost information. This includes balance sheets and profit and loss statements issued annually. In most cases however, the information is not sufficiently detailed to be of any great value. If the contractor's entire output is roughly similar to the subject item, the income statement may be more reliable in checking costs.

d. Engineering and production estimates of the buying establishment.

e. Various financial services such as Moody's, Standard and Poor's, and other financial publications contain recent statements of many companies and such supplementary information as estimates of backlogs of orders and company and industry forecasts. For many products, trade publications and published government surveys provide average percentage breakdowns of total costs which can be used as guides.

Pound-Price Analysis: Pound-price analysis can be very helpful as a means of obtaining a rough approximation of proper cost. Such pricing, however, requires considerable amount of business evaluation and quite accurate weights. Complex apparatus should be broken down in any thorough pound-price analysis, into constituent parts. The materials cost included in most purchases is fairly accurately determinable. The difference between that cost and the quoted price is a factor of considerable value in making price comparisons as between prospective suppliers at any given time making due allowance for changes which may have occurred in respect to material costs.

Direct Material: Direct material is the total cost of all materials entering directly into the finished article. This element is made up of the cost of materials delivered at the storehouse and the cost of storing, handling, accounting for and issuing materials. Withdrawals from regular stores should be charged at their cost under any recognized method of pricing stores withdrawals conforming to sound accounting principles and consistently followed. The material cost will ordinarily include a reserve for rejects but should not include overhead. The material cost should be credited with scrap recovery, cash accounts and over purchasing. Studies show that about 50% of the sales dollar received by a contractor is used in the purchase of materials. This establishes clearly the importance of closer pricing with subcontractors.

In many cases accounting for direct material costs should be a relatively easy task. This is accomplished by analyzing the specifications and computing the costs of the component materials and parts. Material transportation costs to the contractor's plant, extent and cost of contractor's current inventory, contractor's cost system and degree of integration of contractor's operations all influence this estimate.

Even where the buyer has no data other than material prices on which to proceed, it will be found valuable to keep an exact record of such material prices compared with the purchase price for the item in question. A chart showing these two trends will quickly indicate if the trend of the purchase price varies radically from the trend of material prices and will inspire an investigation to disclose the reason.

Direct Labor: Direct labor is defined as that labor which is performed on and properly chargeable directly to the production of the finished article. Direct labor may include compensation insurance and old age benefit and social security taxes pertaining to such employment. Estimates of direct labor costs are important because (1) they enter into the dollar cost estimates directly, and (2) under many accounting systems they are used as the base for estimating overhead costs. Since there is a greater variety in wage rates, since labor hours may be affected more substantially by differences in volume, and since variations in labor efficiency may cause greater differences in costs than material prices, labor costs constitute an important element to be considered.

Labor costs may be checked, after a study of the drawings and specifications, by analyzing the number of labor hours required. Estimates are first made in units of time and then reduced to dollars according to labor rates. In estimating labor hours, facts concerning the plant equipment and processes must be available. The relation of material and labor cost as shown by the census reports of the Department of Commerce or other sources may be employed to calculate labor costs. The buyer can always ascertain if there has been a change in wage rates in the field since the date of his last purchase. If actual changes in the labor factor reflect disproportionate allowance, the buyer seeks to establish price on a more reasonable basis.

Miscellaneous Direct Charges: Frequently there are items identifiable with and properly chargeable directly to manufacturing cost, which items do not come within the scope of direct materials or direct labor, but because they are associated with specific operations or

Analysis of product components provides a basis for analysis of costs

products are logically considered as direct shop costs. Items of this kind are contingencies, royalties or license fees, packaging costs, and installation or servicing costs.

Direct Engineering Expense: Compensation for mechanics, engineers, draftsmen, etc. in production engineering, cost of models, design of tools, preparation of routing sheets, working drawings and specifications, are chargeable to direct engineering expense. Such expenses incurred by studies and improvements of shop and product methods and procedures may be included. Engineering costs such as are involved in research work and development of new products are not includable in the engineering described in this section.

Tools: It is worth while checking with the contractor in cases of continuing orders to ascertain the status of expendible jigs, fixtures, dies, patterns, core boxes, flasks, etc. charged to the first order. This means a determination of the carry-over of such items available for production of the continuing order and the effect thereof on price. Contractors should be asked to make a similar check as far as practicable with subcontractors.

FACTORY BURDEN ALLOCATIONS

A. *Direct Labor Dollars.* Factory burden is usually and most suitably allocated as a percentage of direct labor dollars, particularly where labor constitutes an important part of cost and where investment per man and rates of pay are substantially uniform.

B. *Direct Labor Hours.* The use of factory burden rate per direct labor hour as contrasted with a percentage of direct labor dollars is necessary only when there are wide variations in the rates of pay for the same kind of work.

C. *Machine Hours.* Where direct labor is a relatively minor part of cost, and where depreciation, repairs, supplies and maintenance of machinery are relatively large, factory burden is more equitably applied on the basis of machine hours. Machine hour rates are essential when more than one direct worker operates a machine and the size of crew varies with the type of work, or when one operator handles more than one machine but a varying number of machines are operated.

Many plants charge overhead rates on the basis of the individual departments through which the production flows. In large factories such departments may be further subdivided into production centers. This subdivision provides a more accurate allocation since the rate of charge varies from department to department.

Overhead

Overhead costs are defined as those costs which are usually incurred in connection with the general operations of a plant. They are not charged directly and finally to the item under manufacture in the first instance but are first charged to departments, burden centers, or other overhead units, the cost of which are subsequently apportioned to a particular contract. Overhead consists of factory indirect expense (factory burden, factory overhead or shop expense), engineering indirect expense (engineering overhead), and general and administrative expense.

If any part of the cost of performing a particular function or activity is treated as a direct charge to the contract then no part of such cost is to be included in overhead. Care should always be taken to question average overhead rates and over-absorbed burden. Over-absorbed burden is the term commonly given to the amount by which the overhead computed on a predetermined rate exceeds the actual overhead.

There should be a distinct understanding as to the method of costing overtime bonuses. If it is clear that if overtime bonuses will be paid only because of the purchase in question, they are properly included in the direct labor cost of the contract and will increase in the same proportion as average wage rates as long as the basis for the bonus remains unchanged. However, if overtime bonuses are due to the entire operation of the seller's business, they should properly be charged to overhead, so that only a proportionate amount is included in the price paid under a particular contract.

Overhead and profit are frequently unknown factors to the buyer. It is a fair assumption that these factors should bear a reasonably uniform ratio to the selling price over a period of time, provided volume of business remains nearly constant. If material and labor costs do not change there is no apparent reason for an advance in selling price.

Factory Burden: Factory burden includes all expense of manufacture. It is made up of: *Indirect Labor* such as salaries and wages of supervisers, foremen, shop clerks, timekeepers, tool crib attendants, cranemen, cleaners, packers, shippers, riggers, general laborers, inspectors, etc. who are not directly engaged in productive work; *Indirect Materials* such as lubricants, fuels, paints, heat treating, plating and cleaning supplies, small tools, gauges, factory-office supplies, boxing and wrapping materials, etc.; and *Indirect Expenses* such as light, heat, power, water, gas, compressed air, building and equipment operation and maintenance. Also included are fixed charges with respect to properties used for manufacturing purposes such as: premiums for various kinds of property insurance; property and plant taxes; rentals; and allowances for depreciation of property and equipment.

Factory overhead also applies to salaries and wages paid employees in service and maintenance departments, factory store rooms and laboratories. Laboratory expenses for chemical analysis, for testing and proving related to current manufacturing operations are properly included in factory burden. When laboratory facilities are devoted exclusively to research, the cost of laboratory work should be treated as research and development expense.

The common method of allocating burden expenses to unit cost is to select some figure which is presumed to vary closely with volume of output, such as direct labor hours or

costs, and to work out a ratio such that if each hour or dollar of the unit (as labor) carries its proportional expense, the indirect expense during a normal period will all be absorbed and appropriately divided among the products. These systems suffer from a fallacy; they treat indirect expenses which are ordinarily for the most part fixed as if they varied with volume. Thus, if the overall operations of a plant are increased, there should not be a proportionate increase in factory burden.

Engineering Indirect Expense: The engineering overhead referred to here is that of "production engineering" that is, the overhead consisting of supervision, drafting, supplies, maintenance and repair of engineering equipment, etc. relating to the engineering direct labor involved in work directly chargeable to the contract. Engineering overhead is usually applied as a percentage of engineering direct labor dollars.

General and Administrative Expense: General and administrative expense includes all costs that cannot be charged directly to operating divisions. This includes advertising, selling, materials and administrative expenses and executive salaries. "G & A" is usually applied as a percentage of total manufacturing costs. The projection of the "G & A" should be checked for reasonableness as a general unit with the following charges not admissible: (a) large advertising and selling costs; (b) excessive entertainment expenses; (c) excessive salaries; (d) average transportation charges; (e) taxes which could be deducted from profit.

A few companies have developed a materials expense, which includes the cost of receiving, inspecting and storage of purchased materials, and the necessary clerical expense and purchasing expense. This charge is allocated on a predetermined basis to the combined invoice and transportation costs of the materials.

Profit

The residual income remaining to the entrepreneur after the payment of all costs is pure profit. Ours is an economy motivated by profits. A certain return on money is necessary to make our industrial system work. This does not mean that prices paid by a concern to a supplier must be such as to yield a profit to that supplier regardless of the efficiency of the latter's production methods. There is nothing in our present industrial organization that should guarantee a profit to any person unless that person is as efficient as possible.

In general, the factors considered in determining the fairness of contractor's profits fall into two groups: efficiency with which the contractor has performed his contracts and the risk which he has undertaken in that performance.

Efficiency of Management: The contractor's productive operations are compared with those of other contractors in ascertaining the margin of profit to which the contractor is entitled, and consideration is given to these factors of efficiency.

Other Factors

Price Record of Company: A contractor with a better record for production and close pricing is deserving of a higher profit. Close prices create increased risks and exert pressure on the contractors to reduce costs.

Efficiency in Reducing Costs: The profit earned by the high-cost producer should not be as high as that earned by the lower cost producer.

Character and Extent of Subcontracting: The profit earned by an assembler or a materialman is not regarded as on parity with that of the operator who has all the problems and the risks of an extended and often of a highly integrated production. However, if a contractor supplies engineering supervision, credit, materials or other assistance to subcontractors, he is entitled to a greater reward than when no such aid is rendered.

Inventive and Developmental Contribution: It is considered justified in allowing a higher profit to provide incentives for development work.

Other factors to be considered in evaluating management efficiency include: *Quality of production, Complexity of manufacturing techniques, Rate of delivery,* and *Cooperation.*

Risk: Applicable items of risk include such matters as the complexity of the manufacturing technique with which the producer is confronted; the source of operating capital and equipment; length of contract; delays in production because of difficulty in obtaining raw material. Profit levels and therefore prices should normally be less on contracts where materials, tools, equipment, or financing are wholly or partially provided by the buyer. Profit should be greater on contracts requiring a larger time to complete because of larger permanent investment and of greater hazard of increased material and labor costs. A company which displays a consistent policy of keeping very safe margins in its prices will not be considered as one which is entitled to a reward for taking risks.

If the purchase is small and there is no apparent need to worry about the availability of satisfactory future sources of supply, the buyer generally need not be concerned with the vendor's financial welfare. Under certain conditions, however, protection of the supplier's fair profit margin is an important and necessary consideration. If the buyer is purchasing a large part of the supplier's output, so that his actions will have a determining effect upon the supplier's total net profit; and if in addition, the buyer wishes to maintain continuing relations with the supplier in the future, then it is to the buyer's advantage to see that the supplier continues to remain in business.

Contract Provisions

The fourth pricing technique is the analysis of contract provisions in judging risks and therefore the price. One of the most important elements affecting prices under many contracts is the risk of changes in costs. When uncertainty surrounds future costs the following buying practices prevail.

- Fixed-Price Contracts
  - Short Term
  - Long Term (prices cushioned)
- Cost-Plus Contracts
- Contract Provisions
  - Specific Risk
  - Negotiated Price Adjustment
  - Escalator

It is highly desirable to keep commitments as short as possible as pricing is facilitated. However, short term contracts are not always practical as the buyer may not be able to obtain deliveries or is not willing to take the chance that he may not get the supplies when needed. In order to permit business to continue, essential planning over periods of time and to avoid building up current inventories, long term contracts are often necessary.

Where long term commitments are necessary, a buyer naturally prefers a fixed-price contract. Such a contract enables him to proceed with complete knowledge of what the

goods he has ordered will cost. The fixed-price contract gives a contractor maximum incentives for efficiency if the original price is well negotiated. However, the uncertainty as to costs makes the customary fixed-price contract unsatisfactory in many cases because contractors will necessarily allow for contingencies in their quotations. The hiking of quotations has an inflationary tendency all along the line, and may result in excessive profits if the anticipated cost increases fail to materialize.

Cost-Plus Contracts

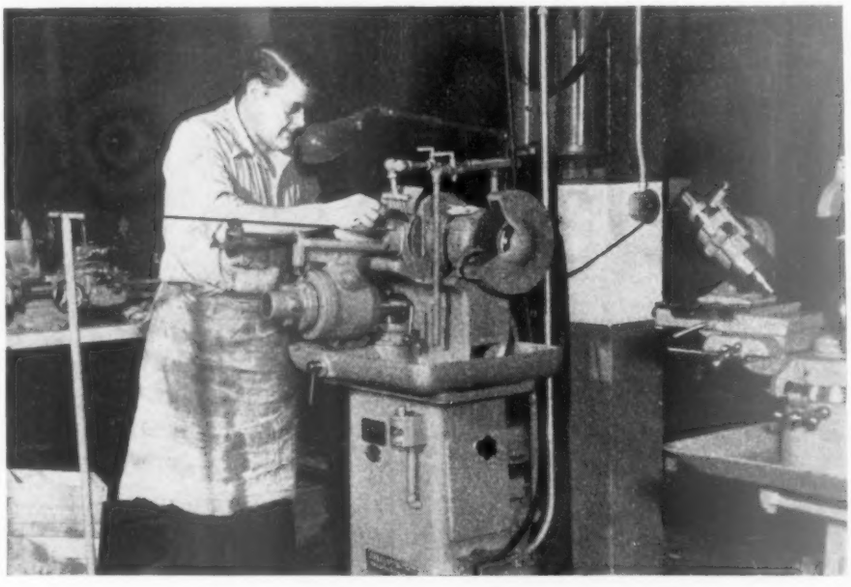
Contracts on a cost-plus-percentage basis are subject to several defects, and government agencies are forbidden by law to use them. One defect is that the interest of contractors — even the most conscientious—in keeping costs at a minimum is not as great as under a fixed price contract. These contracts miss entirely the opportunity of using prices as an instrumentality for reducing costs and increasing manufacturing efficiency. A second defect is that unscrupulous contractors may increase costs in order to run up profit. There are two popular methods of pricing, applied to many raw materials and parts, which are essentially cost-plus-percentage provisions. A general practice is to make quarterly price adjustments merely with notice of revised prices being given to the purchaser a certain number of days before the beginning of the quarter. For many raw materials prices are specified as "price in effect at time of shipment".

The objectionable features of the cost-plus-percentage contracts have been overcome to some extent by the use of cost-plus-fixed-fee contracts for both construction and supply. Elimination of the straight percentage-profit clauses reduces the danger that contractors will deliberately or carelessly increase their costs, but it does not actually give them any great incentive to keep costs down. If a manufacturer's costs are covered no matter what they may be, his incentive for maintaining efficiency and keeping costs down is greatly reduced. Both the cost-plus-percentage and the cost-plus-fixed-fee-contracts (excepting the "quarterly price adjustment" and "price in effect" types) require auditing and for this reason are difficult to administer. There are also involved many controversial features which are inherent in cost definitions under such contracts.

Another method of protection against cost changes which does not suffer from the disadvantages of the cost-plus or fixed price contracts, is the use of price adjustment or escalator clauses. Such a contract is one which contains a base price with a provision that the base will be adjusted for specified changes in costs during the performance of the contract. Suppliers, however, must eliminate applicable contingencies from their price before such clauses are included in their contracts. In using price adjustment clauses, the adjustment usually applies to decreases in costs as well as increases, thus protecting the buyer as well as the contractor. The extent to which contract prices may be adjusted is usually not limited.

The relative advantages and disadvantages of price adjustment clauses necessarily depend upon the individual business situation, the degree of competition in the market, and the best price which the purchaser can secure without an adjustment clause as compared to the price which the purchaser must pay with such a clause. Inclusions in the contract of such articles gives the contractor the desired protection through authorizing adjustments in the agreed price to compensate him equitably for added costs resulting from such changes. They have considerable merit over long-term fixed-price contracts because they help to avoid price increases which are based upon overestimates of cost increases in an unknown future. Advantages over the cost-plus-fixed-fee contract are clear since incentives for efficiency are maintained and audits are avoided. Sound purchasing and close pricing depend in large measure on the skill with which the buyer appraises the risks attendant upon the contractor's production and the steps which he takes to minimize or eliminate such risks through the use of appropriate contract clauses.

At the same time, the aim of pricing requires that the contractor carry the usual risks of inefficiency and other risks which are within his control and for the assumption of which he is paid a profit. Many extraordinary hazards are beyond the control of either the contractor or the buyer, and the inclusion in the agreed price of a fair provision for such and other proper contingencies after identification, segregation and approval is a necessity.



The buyer should be familiar with the processes involved in production

Specific Risk Provisions

Changes: Procurement contracts must be sufficiently flexible to take care of changes which are frequently the reason behind the inclusion of contingency provisions in the proposed price. For changes in specifications or design, quantities, packing or shipping instructions, delivery schedule and delivery point, which cause an increase or decrease in the amount of work or affect other cost

factors, the changes article provides an equitable adjustment of the price.

Variations in Quantities: Production and delivery of exactly the quantity contracted for may be impossible because of peculiarities in the manufacturing processes or because of conditions of packing, loading, or shipping. Contracts may provide that a variation up to 10% in the quantity called for due to any of these specific conditions would be accepted as "a compliance with the contract". The percentage of variation is reduced to 5% or 2% on large quantities. On many items the article is written to provide written approval of the buyer before any increase or decrease can be accepted.

Taxes: It has been the government's policy to eliminate as far as possible the contractor's tax liability at the time of entering into a contract in order to permit removal of unnecessary allowances. Apart from commercial contracts which specifically provide otherwise, a buyer in the commercial market is not expected to pay more than the contract price simply because the seller's taxes are increased between the date of contracting and delivery. Either the government grants tax exemption certificates to those doing government business or it reimburses them in the event additional taxes are imposed. Therefore, a contractor is protected by the government against virtually all changes in his tax liability with the exception of income and excess profits taxes, transportation taxes, taxes on property and social security taxes.

Miscellaneous: Termination and cutbacks, and freight rates are covered by appropriate articles.

Negotiated Price Adjustment

Negotiated price adjustment provisions are used by the Government as protection against possible cost increases particularly material costs and wage rates. This article requires either the contractor or the purchaser to demand; at any time and from time to time; or at prescribed times fixed in advance (usually 3 to 4 months); that the parties negotiate for a revised forward price under the contract. While the government has the privilege of making an audit, it is not mandatory and generally is not employed if the cost statement is satisfactory.

The negotiated price adjustment provision is also used where a true developmental or experimental contract is awarded, where there are no plans or specifications, all of which prevent reliable cost estimates when the contract is made. In such cases, the original price is subject to revision downward only after completion of work on the project. The objection of fixing the price upon completion of work is the cost-plus-a-percentage aspect.

The government uses these clauses only after many conditions are satisfied, including the absence of real competition. The contractor must be able to supply reliable data on which to negotiate requested price revisions. As a consequence, before using these provisions, there should be some assurance that the contractor has an adequate cost accounting system and that the contractor and the purchaser will be able to negotiate the adjustments quickly. Otherwise, the negotiation may be carried on for such a long period that the adjustments cover past production instead of future manufacture. This would give the contractor full cost protection.

These articles are designed to create incentives for reduction of costs through elimination of risk and rewards for low cost efficient operations. In the articles there is expressed the principle that if the contractor, through his efficient control of costs has succeeded in reducing costs below estimates, he is entitled to a reward in the negotiation of the price in the form of an increased contemplated-profit ratio. The War Department felt that was a sounder way to approach it, most importantly from the standpoint of the contractor, because if a formula had been stated, it would have been necessary to have determined factually the exact cost the contractor had incurred in order to prove the spread upon which the formula could apply. In determining actual costs, controversy and disagreement as to what are costs are encountered. In government contracts the use of actual costs introduces the power and duty of the Comptroller General to redetermine the fact of cost and of the government's obligation.

Escalator Provisions

The term "escalation" as used herein means any kind of automatic, or self-operating price revision, whether based on indexes of any character, contractor's costs, O.P.A. maximum prices or any other standard. The term does not include negotiated price revisions.

The usual escalator clause provides automatic increases as raw material prices and wage rates rise. It is necessary for the purchaser to furnish a breakdown of costs of production. Then, assuming that overhead costs will not change, fair proportions of the total price may be designated for labor and materials. It is apparent that escalator clauses tempt the seller to estimate excessive proportions of the total price for these costs. On the other hand, it is to the purchaser's advantage to negotiate for the smallest fair proportions for material and labor costs in the contract, so as to reduce the base upon which the escalation is determined.

There are a number of methods of allowing escalation adjustments for increases in material and wage costs. The actual expenditures for materials and labor in an individual plant may seem to be the easiest solution. If the seller is purchasing his own materials through escalator contracts, the purchaser may simply pay a proportionate share of the price adjustment under the materials contract in the contract for the finished article. Here the contract embodies most of the characteristics of a cost-plus-percentage contract with little incentive to keep material and labor costs at a minimum.

Basis of Adjustment

Usually the estimates for labor and material costs are adjusted in accordance with the behavior of average wage rates or average material prices in the market. The index number given for the base period, usually the month when the contract is negotiated, is taken as 100. The subsequent indexes are then divided by the specific index for the purpose of the contract. Most escalator contracts provide that adjustments be based on data developed by the Bureau of Labor Statistics of the U. S. Department of Labor covering wages and material prices. Though in general the government does not approve of the practice, it has made available clauses permitting the increase in prices of major materials under price control. Protection is thus extended to contractors against increases in O.P.A. ceiling prices of lumber, coal, basic steel products from steel mills, or of gasoline and oil, increases in costs of natural and synthetic rubber, and duck and webbing.

Continued on page 358

THE LAW OF Contingencies and Notification

Recent court decisions establish important principles on validity of limiting clauses in contracts

By LEO T. PARKER

DURING the past year numerous purchasers throughout this country have been subjected to suits on variations of the law involving notifications and contingencies. A review of these higher court decisions discloses that an impressive majority of these cases may have been easily won had officials and purchasing agents been familiar with the modern law.

Contradictory Clauses

First, it is important to know that a printed statement or notice on a contract, receipt, bill head, bill of lading, order form, or letter head is *not* effective if such printed statement is contradictory to other typewritten or pen written portions of the instrument. When deciding which of several contradictory statements is effective it is necessary first to study the formulation or wording of the contract. Modern higher courts agree that contract clauses are of importance in order, as follows: pen written; typewritten; and printed. For example, a higher court (110 N. E. 619) explained the law on this subject:

"Where a contract contains two repugnant provisions, the one printed and other written, it is well settled that the latter must control the interpretation of the instrument, as it is presumed to express the latest intention of the parties. . . ."

The "intentions" of the parties, at the time a contract is made represents the true and legal obligations of the contracting parties. Therefore, in all legal controversies of this nature the primary purpose of the court is to determine the original intentions of *both* contracting parties. For example, it has been held that a notification printed in small, or inconspicuous type, is not effective unless it is referred to in the body of the contract, or directed to the attention of the other contracting party. This is so because the courts have concluded that usually a small and inconspicuous notification in a contract, letter head, order form, bill of lading, or other instrument represents the "intentions" of *only one* of the contracting parties for the reason that the other party may fail to read and understand it. This same rule of law applies to all written contracts.

Fine Print Overruled

An illustration of the modern law, with respect to the validity of printed notifications on letter heads, is supplied by the records of the leading case of Lyons v. Cusimano, 108 So. 414. In this case it was disclosed that an employer sent his employe to arrange the details of a business transaction with a customer. The employe made certain unauthorized verbal statements to the customer and finally the employer and customer signed a written agreement which did not contain the verbal promises. Later the employer wrote the customer a letter acknowledging the contract. Printed in small type at the bottom of the letter was the following notification:

"It is understood that there are no conditions, representations, or warranties, verbal or otherwise, and that . . . no agent or representative has authority to modify the terms of this contract."

Legal controversy developed when the employer failed to fulfill the verbal promises made to the customer by the employe. In the ensuing litigation the employer contended that the printed notification protected him against unauthorized promises made by his employe. However, the court held the notification ineffective, saying:

"The paragraph, in the letter declaring that there were no conditions, representations, or warranties, verbal or otherwise, was printed in very small type, and was not likely to be read. . . . When a written stipulation in a contract made on a printed form conflicts with a general printed stipulation, the written stipulation, having been made subsequent to and with more particularity than the printed stipulation, must prevail over it."

Law Controls

On the other hand, readers should realize that in certain kinds of contracts the contracting parties are bound by inconspicuous notifications, not read nor directed to their attention.

For example, in Boston and Maine Railroad v. Hooker, 253 U. S. 97, the testimony proved that baggage was checked on a first class ticket, and its owner had no notice

CONTRACT TERMS

Here is a matter that works both ways; watch it on your own order and contract forms, and read your vendors' contracts before signing.

Your Form:

If the list of conditions appears on reverse side of order, be sure that a reference to them appears prominently on the face.

If important changes have been made, call them to the attention of the vendor.

If vendor's acknowledgment is not made on your own form, check to see that terms are identical.

If vendor notifies you of any modification or invokes a contingency clause, acknowledge it promptly and specifically, either accepting or rejecting proposal.

Vendor's Form:

Read all terms and conditions carefully before signing the contract.

Be sure that any modifications or special agreements are incorporated by typewritten or handwritten notation on the contract.

File all pertinent correspondence directly with the contract it affects, and be sure that all special conditions are mutually accepted.

Do not reply on applied responsibilities for contract performance.

or knowledge of the regulations limiting the liability of the carrier to $100. During its transportation the baggage was lost due to the *negligence* of the carrier.

The passenger sued the carrier for $2,253, the actual value of the lost baggage. He contended that he was not bound by the $100 limitation clause because he did not know about nor agree to the clause which limited the carrier's liability to $100.

The Supreme Court of the United States held the carrier liable for only $100 because the testimony proved that the carrier had published and kept open for inspection and filed with the Interstate Commerce Commission schedules giving rates.

The same rule of law applies to contracts made with common carriers for transportation of merchandise. The carrier can collect lawful rates notwithstanding special clauses in the bill of lading or contract, or other agreements, by which the shipper agrees to pay less than legal rates. Moreover, a limitation clause is valid, if filed with the proper Commission, although the shipper does not read it.

Another interesting phase of the law is that under certain circumstances an uncontradicted printed notification or stipulation is ineffective.

Printed Notifications in Contracts

For example, in a leading higher court case 246 Pac. 332) it was shown that a seller had printed in inconspicuous type on an order form a notification that no claims on delivered merchandise, not in accordance with the terms of the contract, shall constitute a clause for cancellation unless the complaint is made by the purchaser within 15 days after delivery of the goods. These order forms were signed by the purchaser.

Several days after the 15 days limitation period had expired, a buyer wrote to the seller explaining that the merchandise did not comply with the samples and refused to pay for the same. The seller sued the purchaser. The testimony proved that the delivered merchandise did not equal the samples displayed by the seller previous to signing of the contract. It is interesting to observe that this contract held the purchaser not bound by the printed notice, saying:

"It only remains to be considered whether the printed conditions appearing in the upper left hand corner of the order, which refers to the time within which the objection is to be made to the quality of the goods, formed a part of the contract. . . . The rule seems to be well established that printed conditions on letters or bills of lading or other blanks which are not specially referred to or called to the attention of the other party to the contract, will not be regarded as a part thereof."

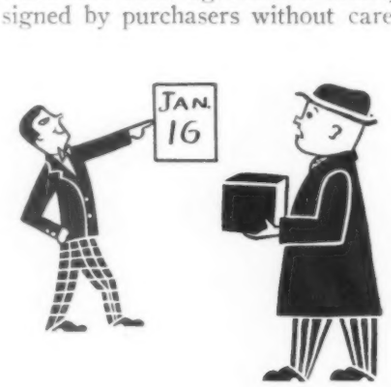
Mutual Understanding

This rule of law, however, is not applicable to written contracts of sale, particularly if both parties have ample time and opportunity to read and understand the various clauses in the contract.

See Ross Company v. Sturgis, 181 S. W. (2d) 426, reported July, 1944, where a seller's salesman and a buyer signed a written sale contract. This written contract provided that the seller would deliver to the purchaser certain merchandise, and this contract contained a conspicuous clause to the effect that in special agreement entered into with the salesman would be recognized as valid unless it was included in the contract, and confirmed in writing by the purchaser.

The higher court held this stipulation volid and refused to hold the seller obligated by verbal statements made by the salesman.

However, with respect to contracts and other agreements usually signed by purchasers without careful consideration, the courts are in accord with the proposition that the seller or his agent must direct the purchaser's attention to special and particularly inconspicuous printed stipulations, otherwise the purchaser is not obligated.



Contract Binding

Another important point of law is that modern higher courts will

not permit a seller to vary or modify the terms of a written contract, unless the purchaser agrees to the modification.

For illustration, in a leading higher court decision, (64 S. E. 553) it was shown that a seller's letter of acceptance of a contract made by his salesman contained a notification, printed in red ink, as follows:

"Quotations subject to change without notice. All agreements are contingent upon strikes, accidents, and other delays beyond our control."

The seller failed to deliver the goods, because of difficulty in obtaining raw materials. The purchaser sued for damages. Notwithstanding the printed notification, the court held the seller liable for failure to deliver the goods, saying:

"If a contract in writing is plain and clear and unambiguous in its terms, *it is not subject to modifications by a statement in a letter head, printed at the top of the paper,* which is not incorporated into the contract and is inconsistent with it. Even where a printed form of contract is used, but terms are written into it which are variance with the printed matter, the writing will control."

Effect of Custom

Sometimes an established trade custom has considerable bearing on the validity of a notification printed on a contract, receipt letter head, or other instrument. In fact, since all contracts are construed by the courts in view of ascertaining the original intentions of the parties, at the time the contract was made, it has been held that where a printed notification coincides with a well known custom, generally recognized by the trade, the notification is binding on the parties. Also, where it is shown to the satisfaction of the court that a printed notification was recognized and adhered to by the contracting parties in *prior dealings,* it is valid and a part of the contract.

For example, in a leading case (142 S. W. 1107), it was disclosed that a purchaser mailed a written order to a seller. Upon receiving the order the seller wrote the purchaser and accepted the order. In the corner of the letter head appeared the following printed notification:

"All orders and contracts subject to car supply, strikes, accidents and causes beyond our control."

The seller was able to deliver only a portion of the merchandise because of reasons beyond its control.

The purchaser sued the seller alleging a breach of contract. However, the court held the printed notice on the letter head a part of the contract, because the trade custom and prior dealings between the contracting parties had recognized validity of the notification.

Missing Bill of Lading

Also, see Dixon v. Chase Nat. Bank of City of New York, 144 Pac. (2d) 759, reported January, 1945. In this case the testimony proved that a seller contracted to sell cotton to a purchaser. The Chase National Bank was requested to issue in favor of the seller two irrevocable letters of credit for $7,000 and $3,500, respectively, to finance the sale. The Chase Bank did so and mailed them to the seller.

They bound the Chase Bank to honor two 90 day drafts if presented at its office on or before a stipulated date and accompanied date and accompanied by specified documents, including a "full set of bills of lading" which evidenced shipment of a stated quantity and quality of cotton. The seller duly shipped the cotton, receiving for each shipment two originals of the bills of lading. Through the Guaranty Trust Company of New York, the seller's drafts and documents were presented to Chase Bank but only one of the set of two bills of lading was delivered. In lieu of the other, which was in the mail and not yet arrived in New York, an indemnity agreement or guaranty against loss, resulting from its absence, was tendered the Chase Bank by the Guaranty Trust Company. Chase Bank refused to honor the drafts on the ground that one full set of the bills of lading was absent. Chase Bank contended that failure of the seller to present this set of bills of lading was a breach of the contracts.

The seller sued the bank and proved that for some time there had existed a general and uniform custom among New York banks, exporters and importers to the effect that in lieu of a missing bill, presented under credits calling for a full set of bills of lading, that the bank issuing the credits would accept in lieu of the missing bill or bills of lading, a guaranty of a leading and responsible New York bank.

In view of this testimony the higher court held Chase Bank liable for breach of its contract. This court said:

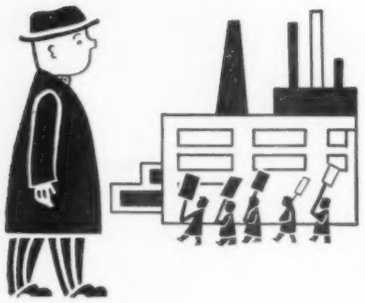
"In our opinion the custom under consideration explains the meaning of the technical phrase 'full set of bills of lading' and is incorporated by implication into the terms of the defendant's (Bank) letters of credit . . . . It is well settled that parties who contract on a subject-matter concerning which known usages prevail, incorporate such usages by implication into their agreements, if nothing is said to the contrary."

Therefore, it is quite apparent that circumstances may exist under which "custom" has greater weight than valid provisions in a contract.

Bilateral Contract

It is well established law that a contract is void if only one contracting party is obligated to perform obligations. On the other hand, when merchandise is "sold" under a sale contract the terms of which are agreed to by both parties, there necessarily arises by implication an irrevokable agreement by one of the parties to sell and an agreement by the other to buy. Therefore, such an agreement on its face constitutes a valid bilateral contract between the parties, by the terms of which each party is *positively* obligated to perform its respective promises.

And while contingency clauses may be void if printed in inconspicuous type, yet such clauses are valid and effective if brought to



the attention of the other contracting party, or purchaser.

For instance, in Slater v. Savannah, 110 S. E. 759, it was disclosed that a buyer and a seller entered into an agreement containing a clause which relieved the seller from liability if the latter failed to make the delivery as a result of "labor difficulties, or any other cause beyond its control".

When the purchaser refused to accept delivery of the shipped goods, the buyer filed suit.

The buyer attempted to avoid liability on the grounds that the contract was void because the seller was not *positively* obligated to deliver the merchandise, since he could refuse to make delivery if he had labor difficulties.

However, it is important to know that the higher court held the contract valid, holding the purchaser liable, saying:

"If the seller's obligation to sell nullified or destroyed by the clause of the instrument which relieves the seller from responsibility under it if shipment is prevented by war conditions, strikes, labor difficulties, etc., or any cause beyond the seller's control? These are all contingencies beyond the control of the seller . . . . a provision to this effect does not nullify the party's obligation, and therefore could not effect the validity of the instrument or deprive it of its mutuality."

Therefore, notwithstanding the fact either a buyer or seller may avoid liability, or cancel a contract, on development of a contingency, yet the contract is valid if the contingency does not arise.

Clause Not Answered

A contract made by a series of letters or telegrams is equally as binding as a written or printed contract signed by the contracting parties. Also, the general principles of the law of contracts are applicable in determining the outcome of legal controversies involving agreements made by correspondence, although many numerous additional complications may be found in this class of contracts. For example, under certain circumstances a court will imply a valid contract by correspondence, although a valid contract never arises by implication from a single instrument.

Another important point of the law is that a valid contract ordinarily does not exist where either the buyer or seller fails to accept the exact offer submitted by the other, yet circumstances may exist in transactions by correspondence under which the court will *imply* that failure of any one party to answer a clause or notification in a letter or telegram is equivalent to an acceptance of the terms of the clause or notification.

For illustration, in the leading case of N. Jacobi Company, Inc., v. Vietor, 11 F. (2d) 30, it was disclosed that a buyer wrote to a seller asking for prices on stipulated merchandise. The seller acknowledged receipt of this letter and promised to quote the prices on the merchandise as soon as possible. Within a few days the buyer again wrote asking for prices, and called the seller's attention to the fact that a number of factories were soliciting orders and giving prices with guarantees against price decline. The seller answered this letter quoting the merchandise, at 53 cents per pound, and stated that he would accept orders up to April 1st, but he would not give a guarantee against declining prices.

The buyer replied to this letter and sent an order to be shipped April 1st. This latter contained no reference to any price guarantee.

The seller immediately forwarded to the buyer a formal order to be signed by the latter, with duplicate copies. The buyer signed the order and forwarded it to the seller with a letter containing the following statement: "We understand that you guarantee us against any decline of prices you may make on same." The seller replied: "You mention in your letter that you understand we guarantee the price. We beg to state that we have never made a practice of guaranteeing prices on merchandise and do not do so now."

The buyer made no reply to this letter and did not attempt to revoke or cancel the order. Later the price of the goods declined and after some further correspondence the buyer cancelled the order. The seller refused to accept the cancellation and soon thereafter filed suit against the purchaser to recover damages equal to his lost profits on the quantity of merchandise specified in the contract.

The buyer defended the suit on the contention that one of his letters contained a clause which distinctly stated that he understood the seller guaranteed against decline of the prices. However, in view of the fact that the buyer had failed to answer the letter in which the seller had stated that he would make no guarantee against decline, the court held the buyer liable saying:

"The offer had already been unconditionally accepted, and the terms of the contract had become fixed. It amounted at the most to a proposed alteration of the contract, made after unconditional acceptance, which could not affect the contract, in the absence of assent by the other party."

Read Before Signing

So, therefore, neither a buyer nor seller may expect to rely upon an obscure clause in a contract to win possible future suits. This same law is applicable to inconspicuous clauses or notifications.

For example, a purchaser may avoid responsibility of an inconspicuous clause in a contract merely by testifying that he did not observe or read it, providing no conflicting testimony is presented. This is so because the courts consistently hold that the valid and enforceable terms of a contract must come within the scope of the intentions of *both* contracting parties at the time the contract was made. And if the buyer did not see nor read an inconspicuous clause he did not intend to be bound by it.

On the other hand, irrespective of how inconspicuous a contract clause may be, the buyer is bound by it if the seller proves either that the buyer read it or that it was directed to his attention, before the contract was signed.

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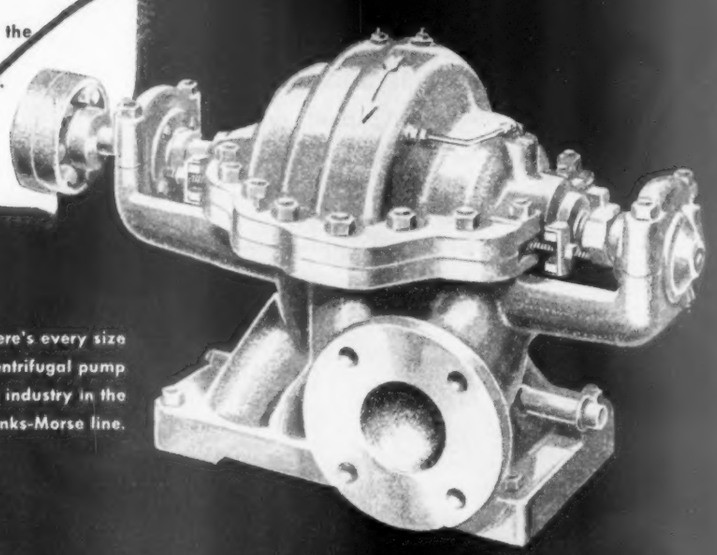

There's every size and type of centrifugal pump used in industry in the Fairbanks-Morse line.

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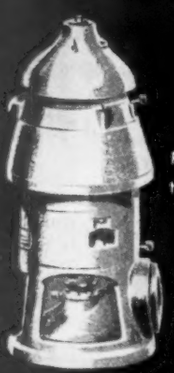

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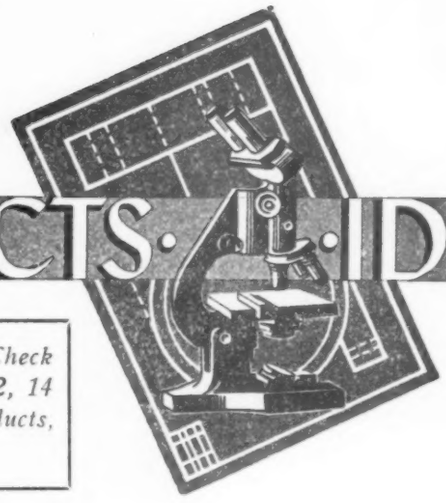


Purchasing Agents and their Assistants are invited to Check the Coupons on the "Know-How" Pages, Nos. 10, 12, 14 and 16, for late catalogs and bulletins on New Products, Materials, Finishes, Equipment, etc.

SMALL TOOL DEMAGNETIZER

DEMAGNETIZER for small tools with a diameter of 7/16" or less has been announced by Grayhill, 1 No. Pulaski Road, Chicago, Ill. The unit is 3" x 1¾" x ¾" and operates from 115 volt AC circuit. Unit can also be used to magnetize an object.

PRECISION MOLDED "O" RING SEALS

PRECISION molded synthetic rubber hydraulic "O" Ring seals for commercial equipment, are announced by the Plastic & Rubber Products Inc., Dayton 7, Ohio, who state they have executed license agreement with the patentee to manufacture and sell "O" ring seals. The company also is equipped to mold various precision products such as diaphragms, "U" cups, "V" packings, mechanical seal parts, gaskets, piston cups, etc. Parts may be molded with tolerances maintained as close as plus or minus .0015".

MOTOR GREASE

FOR dependable lubrication from 13° F to 176° F for all speeds up to 3600 rpm and for horizontal and vertical operation, improved grease for ball and roller bearing motors is announced by Westinghouse Electric Corp., 306 4th Ave., Pittsburgh, Pa. It is available in 8 oz. nasal type tube. Grease is stable and highly resistant to oxidation.

BATTERY POWERED RESISTANCE WELDERS

LINE of battery-powered resistance welders marketed by Progressive Welder Co., 3050 East Outer Drive, Detroit, Mich. is now available with internally water-cooled storage batteries which make possible increased output with fewer batteries, especially when welding aluminum and other metals or alloys requiring high fusion currents. Other advantages are decreased battery maintenance, longer battery life, more constant operating temperature, reduction of evaporation and refilling required, etc.

MINIATURE WELDER

COMPACT, fast and easy to handle miniature welder is announced by the Hampton Electric Mfg. Co., 12th St. & Pine Place, New Kensington, Pa. It is known as the Model J. The unit is 10" deep x 14½" wide x 16" high and weighs 110 pounds It has 10 welding heats on either 110 or 220 volts. It has no jacks, plugs, magnetic switches or rotating parts.

FLEXIBLE PORCELAIN-LIKE FINISH

BAKING enamel said to be unusually fast drying and of unusual durability is announced by H. V. Walker Co., Elizabeth, N. J. Name is Porciflex. Finish has high resistance to acids, alkalis, oils and greases. Applied by spray, roller coating, machine, or dip, Porciflex is baked at schedules from one minute at 450 deg. for sheet steel to 15 minutes at 275 deg. for other types of work. It is well adapted for infra-red baking. It is available in clear, black, white, and all colors. Maker states it will not crack or flake when struck and will not peel off under normal conditions.

SAFETY GAUNTLET CUFF

SAFETY gauntlet-cuff that is said to afford big savings to users of gauntlet-style industrial gloves, is announced by C. Walker Jones, Philadelphia 38, Pa. The Jomac gauntlet-cuff is a separate piece—an extra strong covering for the forearm. When gloves become worn they may be replaced, the gauntlet-cuff being retained which fits snugly at the wrist around the new glove.

WOODEN CONCRETE FORM COATING

FORMFILM is announced by the A. C. Horn Co., 43 Tenth St., Long Island City, N.Y. for coating surface of plywood forms. It makes for smooth concrete free from grain markings and ready for painting if desired. It is highly water repellent, and Horn Company states that concrete will not adhere to forms at any stage of drying. Plywood forms may be used 4 to 5 times without recoating.

AIR CONDITIONING UNIT

PACKAGED air conditioning unit announced by the Curtis Refrigerating Machine Division of Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis, Mo., is said to provide complete air conditioning system in one compact unit which cools, dehumidifies, circulates, and filters the air. It can be adapted for heating and humidifying also. It is available in 3 and 5-ton capacities.

(*Continued on page* 140)

GRAY-MILLS SUPERFLO

The CENTRIFUGAL PUMPS of *Superformance!*

- More volume per horse power
- Service-free performance
- Compact... Streamlined design

• The advanced design and built-in efficiency of Superflo Pumps gives them increased capacity to the point where, a ⅛ H.P. model is equal in volume delivered to many ¼ H.P. pumps.

Superflo's integral-streamline design gives compactness, strength and ease of installation. Dependable — service-free in performance, they are ideal for pumping coolants, cutting oils and lubricants, and are easily adapted to any machine. The flow can be regulated from a drip to a full stream without overloading the motor. Capacities from 9 to 44 gallons per minute. Models available for fluids with high abrasive content. There's a Superflo Pump for "superformance" on almost every application . . . for replacement or as original equipment. Write and tell us your needs.

Models for Most Every Need

For horizontal-external mounting.

For submerging in coolant reservoir.

For submerging in tank and mounting to cover.

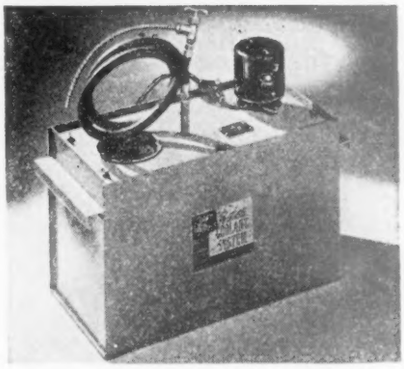
For submerging in tank, or mounting integrally with cover.

GRAY-MILLS CO.
1928 Ridge Avenue Evanston, Illinois

GRAY-MILLS **SUPERFLO CENTRIFUGAL PUMPS**

PORTABLE COOLANT SYSTEMS • PORTABLE PUMPING UNITS
INDUSTRIAL FLUID REFRIGERATION • PARTS CLEANING SYSTEMS

GRAY-MILLS *Portable* PUMPING UNITS



Gray-Mills Centrifugal Model. Available in two models — 540 gallons per hour and 2650 gallons per hour at 4 foot heads.

FOR PUMPING
Coolants and Cutting Oils — Lubricants — Solvents — Quenching Fluids — Inks and Paints — Other Fluids and Solutions.

In hundreds of industrial applications Gray-Mills Pumping Units are supplying fluids, such as those listed above, for a variety of uses. These compact, self-contained systems apply a fluid at the point of use, either in constant flow or intermittently. They may be used for recirculating fluids, as in a coolant system—or to pump liquid from one point to another.

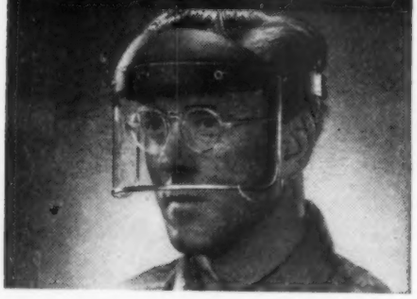
Think over your fluid handling problems—perhaps you'll find a Gray-Mills unit is a simple, low-cost answer—and if you have a special problem, there is a Gray-Mills engineer ready to help you work it out. Write for catalog and full details.

Model G Series. For capacities from 60 to 130 gallons per hour, pressures from 10 to 20 lbs. p.s.i. Tank capacities 3½ and 5 gallons.

Model A Series. For capacities from 60 to 180 gallons per hour, pressures from 10 to 50 lbs. p.s.i. Tank capacities 10 and 12½ gallons.

GRAY-MILLS CO.
1928 Ridge Ave., Evanston, Ill.

Day Long Protection on "Semi-Hazardous" Jobs



• Workers keep the Willson Protecto-Shield* *on*. Because it combines safety with real comfort and smart appearance. Ideal for light duty jobs. Examples: spot welding, light grinding, wood working.

• Lightweight visor swings up easily when not in use. Held firmly in place by exclusive "Slot-Lock." Both visor and sweatband easily replaceable. Shield is roomy enough to wear over glasses.

• Oversize visor available to guard sides of face and ears from splash and flying particles. Three visor lengths: 4, 6 or 8 inch. Two thicknesses: .030 or .060 inch. Two colors: clear or Willson Tru-Hue green, which prevents color distortion.

For help on eye protection problems get in touch with your Willson distributor or write for information.

*T.M. REG. U. S. PAT. OFF.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON PRODUCTS INCORPORATED

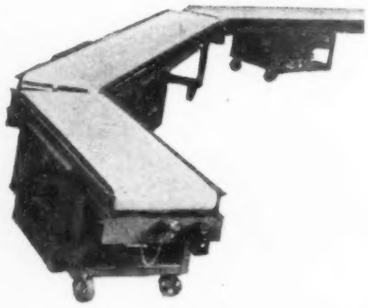
Established 1870

221 WASHINGTON STREET - READING, PA., U.S.A.

NEW TYPE AYJ RELAY FOR D-C OPERATION

TO provide almost instantaneous magnetic overload protection on general purpose and mill motor applications, and to prevent damage to hoist, windlass and capstan equipment when the load or cable jams on marine control, new type AYJ relay for d-c operation is announced by Westinghouse Electric Corp., Box 868, Pittsburgh, Pa. Of sturdy unit construction with a knife-edge bearing between the armature and the frame, the relays are completely assembled and tested before shipment. Ground armature and frame surface are plated with hard chromium.

POWERED BELT CONVEYOR



FLEXIBLE portable power conveyor that requires no guides, in 10′, 5′ and 3′ lengths, is announced by Island Equipment Corp., 101 Park Ave., New York, N. Y. Units may be coupled together, and will convey on level, up or down grade. Two sections will make a 30° turn; 3 sections 60°; 4 sections 90°. Controlled from unloading end by push button control. Belts come in 3 widths, 12″, 16″ and 20″. Differential rolls available for use on turns. Units will carry distributed load of 400 pounds. They are driven by motorized power unit.

STEPLESS RANGE POWER FEED

NEW "stepless-range" power feed for use on drill presses, milling machines, surface grinders, etc., is being introduced by The Bellows Co., 861 E. Tallmadge Ave., Akron, Ohio. It is known as Bellows Cenacon Feed. At touch of handle, the "Feeds" advance work or tools a predetermined distance, under a predetermined power thrust and automatically return to starting position. Precision controls are said to be simple and positive. Feed is powered by Bellows air motor and operates on any air pressure up to 160 pounds delivering a power thrust approximately five times operating air line pressure. Feeding rate can be adjusted to meet requirements. Hydraulic resistance unit known as the Hydro-Check, which provides constant feeding rate, is available in range of six sizes to meet stroke requirements. Hydrocheck is not standard equipment.

ARC-WELDING COMPOUND

NEW arc-welding compound designed to aid in instantaneously creating and maintaining a metallic welding arc where low currents and small diameter electrodes are employed, is announced by the Electric Welding Division of the General Electric Co. Known as Strike-easy, the new compound is easily applied and can be used on any kind of metal with any type of electrode. Compound is in paste form in one-pound glass jars, ready for use.

RECTANGULAR MAGNET FOR TRAMP IRON REMOVAL

A SELF-cleaning, rectangular, electro-magnet for use where a large amount of miscellaneous iron is to be separated, is announced by the Dings Magnetic Separator Co., Milwaukee, Wis. Unit is completely automatic in operation with the aid of a cross-belt that conveys tramp iron to a discard pile. Non-magnetic angles diveted to the cross-belt plus a fast belt speed assure quick removal of tramp iron from the magnet face. Separator is said to prevent iron from forming over the magnet in a layer that might drag material being passed on the lower conveyor belt. Magnet is available in widths comparable to that of the conveyor belt over which it is to be suspended. Available in both standard and heavy-duty intensities. Further details furnished on request.

NEW DIAPHRAGM CHUCK

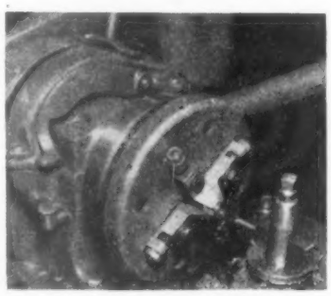
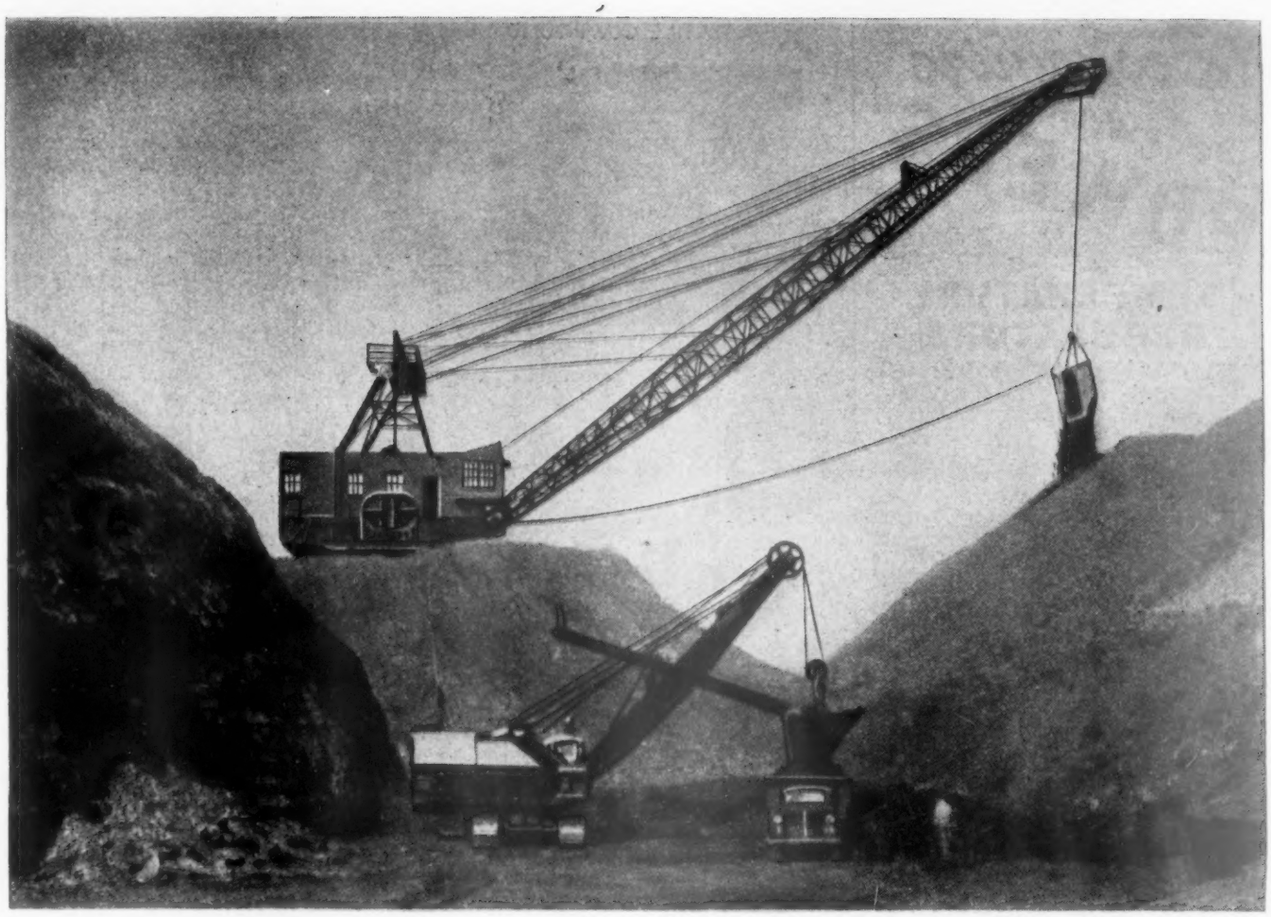


ILLUSTRATION shows new Woodworth diaphragm chuck mounted on 12″ bench lathe for boring small parts, tolerance on ¼″ hold being .0005 concentric with the O.D. within .0005 total indicator reading. The chuck is adaptable to various types of machine tools and can be actuated either manually or by air. The maker, N. A. Woodworth Co., Detroit, Mich., says it is a means for increasing production and reducing costs in secondary machining operations such as grinding, diamond boring and light turning. Chucks can be made to grip either on the inside or the outside of the part to be processed.

(*Continued on page* 142)



One Of Wire Rope's Toughest Jobs!

THIS huge earth mover, known as a walking dragline, operating in a coal strip-mine, scoops up 6 tons of earth at every swing, each 50 to 60 seconds, day in and day out. Its efficiency---in fact, its ability to perform continuously month after month, year upon year---depends largely on a few strands of wire rope. ***This is one of the toughest jobs which wire rope is called upon to perform.***

Through these cables is transmitted all the power of a 400 horsepower Diesel engine, to swing a 160 foot steel boom and a truck size drag bucket. The wire from which this cable is made must be tough and strong---must resist abrasion---must be uniform in gauge and possess flexibility and other positive characteristics. These are the salient reasons why these cables are made from Youngstown's Yolectro High Carbon Rope Wire.

Like all its wire mill products, the wire supplied by Youngstown to wire rope manufacturers is of finest quality steel, refined, rolled and drawn to exact specifications. Youngstown wire can be furnished now to your specifications. Write, wire or phone our nearest branch.

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN 1, OHIO

Export Office . . . 500 Fifth Ave., New York

Manufacturers of

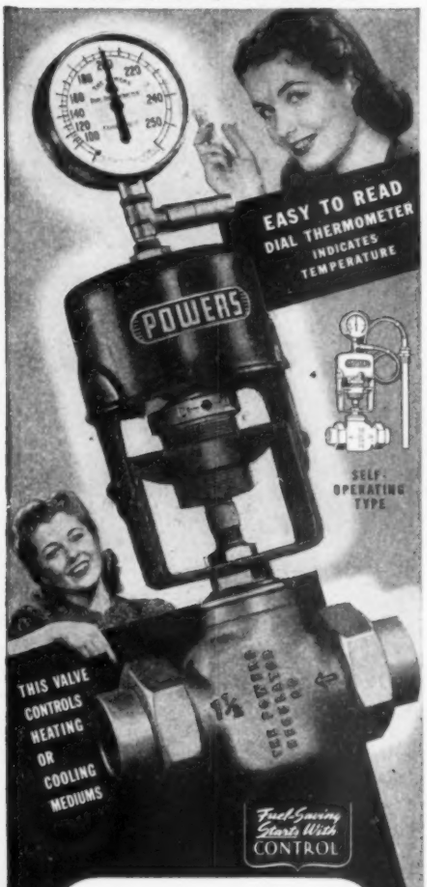
CARBON · ALLOY AND YOLOY STEELS

QUALITY · YOUNGSTOWN · SERVICE

Wire - Nails - Bars - Rods - Sheets - Plates - Conduit - Pipe and Tubular Products - Electrolytic Tin Plate - Coke Tin Plate-Tie Plates and Spikes.

Economize WITH POWERS

TEMPERATURE REGULATORS



Use a Powers No. 11 Temperature Indicating Regulator when you want the advantages of an easy-to-read dial thermometer combined with a dependable self-operating regulator. The dial thermometer gives a visual check on the performance of the regulator and makes it easy to adjust for the required operating temperature. Various dials and ranges are available.

Is Easy To Install—because both the thermometer and the regulator operate from the same thermal system—only one tapped opening is required.

Write for Circular 2511

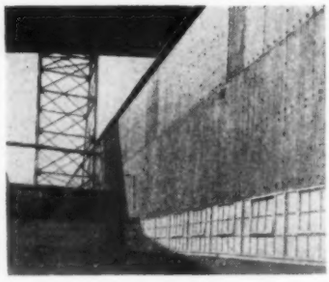
THE POWERS REGULATOR CO.

2792 Greenview Avenue, Chicago 14, Illinois
231 E. 46th St., New York 17, N. Y.—Offices In 47 Cities . . . See your phone directory.

70

OVER 50 YEARS
OF AUTOMATIC TEMPERATURE AND HUMIDITY CONTROL

PROTECTIVE COMPOUND

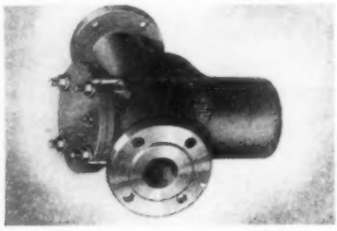


PLASTIPITCH protected metal for roofing and siding on industrial and other buildings, is new building material developed by Koppers Co., Inc., Tar & Chemical Division, Pittsburgh, Pa. It consists of flat, corrugated or V-crimp steel sheets the surfaces and edges of which have been treated with "Plastipitch" a compound perfected by Koppers. It is said to have permanent adherence to metal and to thoroughly protect base from rusting, corrosion, salt air and the effects of chemical fumes. Material may be used for gutters, ventilators, flashing, ducts, etc.

FLOATING PISTON HYDRAULIC VALVE

NEW 4-way hydraulic valve announced by Geroter May Corp., Logansport, Inc., has "floating piston" design which is said to provide greater operating efficiency and ease of operation. It permits close fitting of the piston in the valve bore and gives maximum sealing ability. "O" ring seal on valve covers assures positive sealing with no gasket. Valves are suitable for oil service with pressure up to 1500 psi; can be furnished from 2500 to 3000 psi oil service. They are offered with four types of action—standard, spring return, spring centered and ball detent; 7 sizes, ¼" to 1½".

PIPE LINE STRAINER

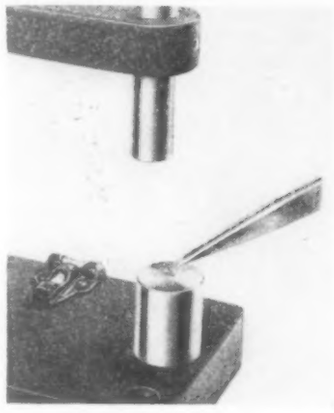


PRESSURE and suction pipe line strainer which maintains maximum liquid flow through piping systems while performing necessary function of protecting pumps and moving parts of other vital equipment, is announced by J. A. Zurn Mfg. Co., Erie, Pa. Maximum liquid flow is assured as total area of strainer basket perforations exceeds the area of the opening of the inlet by more than 2 1.5 ratio. Available for either high or low pressures. Depending upon requirements, units are made in cast bronze, steel, semi-steel, iron, or alloyed metals.

ANNOUNCE NEW SOFT SOLDERING FLUX

NEW organic soft solder flux which does not normally leave a corrosive residue on the work, is announced by Superior Flux Co., Public Sq. Bldg., Cleveland 13, Ohio. It is known as No. 30 Supersafe Soft Solder Liquid Flux, and is recommended particularly for applications where rosin-alcohol is unsatisfactory or where strong acid fluxes cannot be used because of the corrosion factor. Composition was developed by Battelle Memorial Institute. It may be used in soldering copper, steel, silver, brass, various alloys and electroplated parts.

SMALL PARTS HARDNESS TESTER



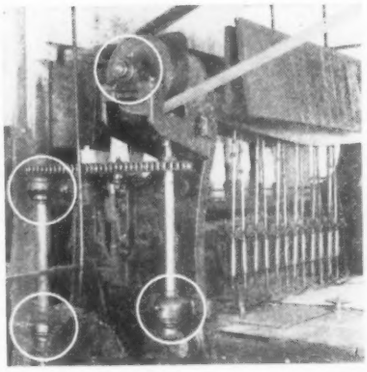
NEW magnetic hardness tester for rapid, accurate testing of hardness of small ferous, metal parts, is announced by General Electric's Meter and Instrument Divn., West Lynn, Mass. Providing a convenient "go—no go" hardness gage, this tester simplifies inspection of such parts as electric-instrument pivots and shafts, watch shafts, small steel balls, and other parts too small to be production-tested with mechanical type hardness testers. It also permits spot checking of hardness in large sheets, or lengths of steel wire, through the comparison of random-selected small samples. Test will distinguish differences as little as two points on Rockwell "C" scale.

ALUMINUM COATING COAL-TAR BASE

ALUMINUM coating in coal tar base which is claimed to do the double job of presenting an attractive surface along with corrosion-resisting properties, is announced by Reilly Tar & Chemical Co., Indianapolis, Ind. Coating can be either brushed or sprayed on, and manufacturer states it will not flow during or after drying; and after drying, it will not crack, check or peel on exposure to temperatures as low as minus 30° F., nor flow at temperatures as high as 160° F. It may be used on metal, cement, tile, wood and brick surfaces. Printed matter available.

(*Continued on page* 144)

The Babbitt Pot's on the Shelf with the Old Shaving Mugs

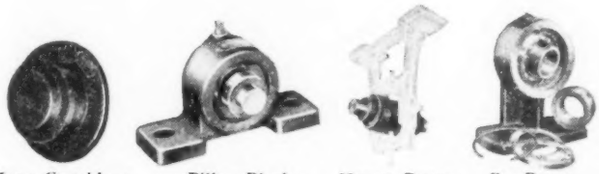


There's a New England manufacturer of building specialties whose heavy machinery handled rough, tough jobs like cleaning and shredding seaweed and sewing it between fireproofed paper to make insulating bats. Noontimes, when the machines were stopped, it was somebody's job to rush around with a babbitt pot to "doctor" the bearings.

More than ten years ago they put the old babbitt pots up on the shelf along with the old shaving mugs of yesteryear. And they put Fafnir replacement ball bearings . . . motor cartridges, hanger boxes, pillow blocks and fan boxes . . . everywhere they'd had plain bearings. Now nobody has to rush the babbitt pot because Fafnirs require lubrication only once every six months or so.

What's more, most of these Fafnirs have been taking corrosive action, terrific loads and every kind of dirt and dust for years and years . . . some for as long as ten years . . . without a single complaint. In one spot, the huge sewing machines that make seaweed into insulation bats, where gears had to be replaced every year or two, Fafnirs have been on the job even longer than ten years.

There's much more to performance like this than the superiority of ball bearings over plain bearings: there's the engineering sense in the Fafnir plant and out in the field which makes plant people say, "Let's put it up to Fafnir first." The Fafnir Bearing Company, New Britain, Connecticut.



Motor Cartridges Pillow Blocks Hanger Boxes Fan Boxes

MOST COMPLETE LINE IN AMERICA

You'll find it pays to call your INDUSTRIAL SUPPLY DISTRIBUTOR first.

FAFNIR BALL BEARINGS

PROPERLY planned and integrated tags can do a lot to help you get back to top production on peacetime lines. If your present system is keeping you in hot water, why not decide right now to put the problem up to Dennison.

Dennison has been studying this subject for years. During this time we have helped develop modern, smooth-functioning tag systems for practically every industry and type of manufacturing operation. So don't hesitate to send us your problem because you feel it is "different."

Whether you are primarily interested in better tags for raw materials control—production routing and scheduling—inspection—shipping records or other phases of your plant operations, Dennison can offer you practical suggestions.

Remember, too, that you do not have to pa a premium price for experience and know-how when you put your problems up to

Dennison

SPECIALISTS IN PAPER PRODUCTS FOR OVER A CENTURY

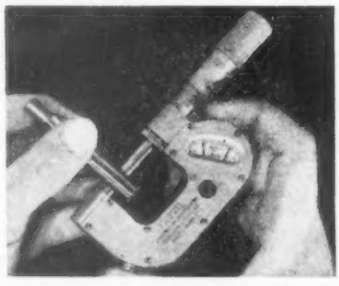
Many Dennison-developed production tags are for hand endorsing. Others are imprinted with variable code information by our Dial-Set Printer. For further information write Dennison Manufacturing Company, 279 Ford Ave., Framingham, Mass.

TAGS • LABELS • SEALS • SET-UP BOXES • MARKING SYSTEMS • PAPER SPECIALTIES

LEGGING AND SPAT

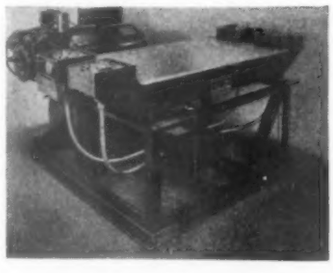
NEW legging and new spat, designed to provide maximum protection are announced by American Optical Co., Southbridge, Mass. Legging provides complete leg protection, and is featured by easy adjustment and quick release. It is available in chrome leather, and may also be obtained in asbestos or fire resisting duck. All leggings have chrome leather flare over the instep. The new spat is identical in construction with the new legging, except for its shorter length, and provides full protection for the instep and ankle.

DIAL INDICATOR MICROMETER



MICROMETER with dial indicator has just been introduced by Federal Products Corp., Providence, R. I. It combines the accuracy over the full inch of the micrometer screw and the precision of the dial indicator. It can also be used as a dial indicator comparator — the micrometer furnishes its own precision setting. Anvil pressure is constant and real accuracy of instrument can be realized, independent of "feel." Use as a comparator makes it highly advantageous for short runs, and equally valuable as direct reading instrument where frequent changes occur in diameters and tolerances. It is known as the Federal Indicating Micrometer, 200P-1.

VIBRATION TEST TABLE



REACTION type vibration test table for shaking out faults in assemblies and components, is announced by L. A. B. Corp., Summit, N. J. Equipment has maximum capacity of 400 lbs., and is operated by a 5 hp motor. Overall dimensions are 52″ x 58″ x 32″ high. Table top is 24″ x 40¾″.

(*Continued on page* 146)

Call in SOCONY-VACUUM for this Correct Lubrication Program

- Lubrication Study of Your Entire Plant
- Recommendations to Improve Lubrication
- Lubrication Schedules and Controls
- Skilled Engineering Counsel
- Progress Reports of Benefits Obtained

GARGOYLE Lubricants

No, this isn't an engineer's nightmare! It's our conception of the different types of gears in your plant, linked in a continuous train. Production costs . . . and profits . . . depend on efficient operation of gears like these. Each gear has its own lubrication needs.

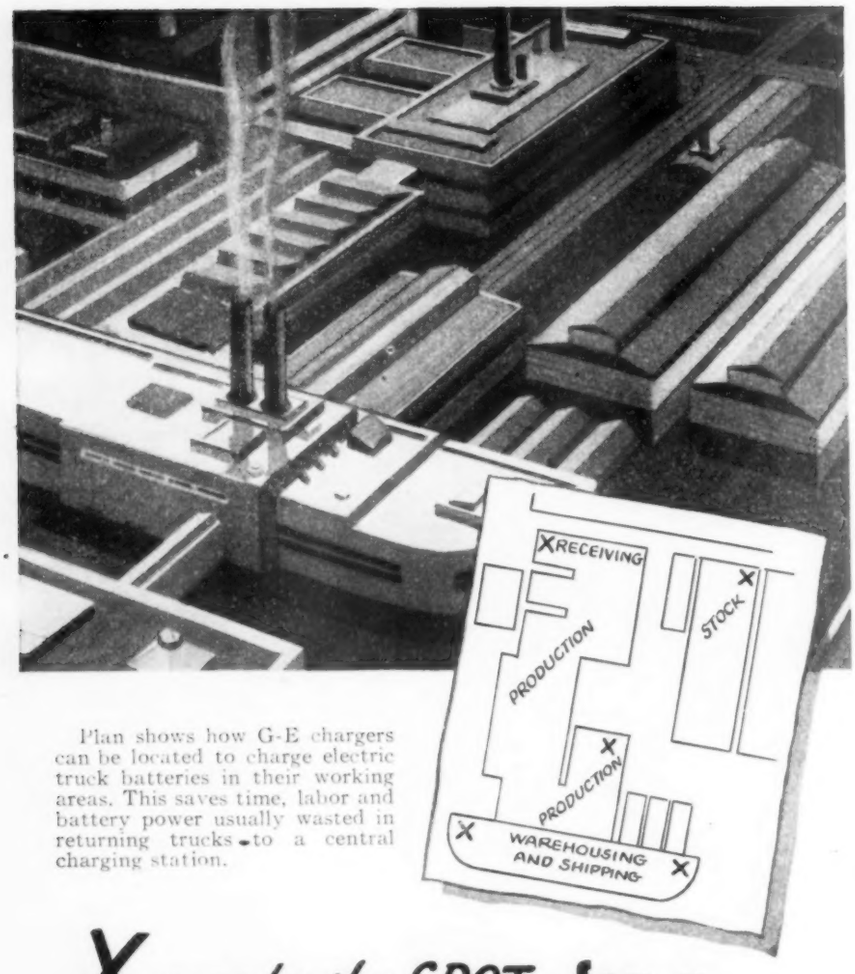
Some are ordinary open gears. Socony-Vacuum makes a special "Black Magic" fluid to prolong their life. There's a worm gear. Socony-Vacuum has special oils that stay on despite the wiping, sliding action. There are herringbone gears, hypoids, bevels and spiral-bevels. Socony-Vacuum engineers have the products . . . and the knowledge . . . to assure scientific lubrication for every type under every condition.

The same applies to all bearings and cylinders. Socony-Vacuum's great new wartime developments, backed by 80 years' lubrication experience, are available in a Complete Lubrication Program for your plant. Insure maximum machine efficiency now with this program.

Socony-Vacuum Oil Co., Inc.

and Affiliates: Magnolia Petroleum Company, General Petroleum Corp. of Calif.

Tune in "Information Please"—Monday Evenings, 9:30 E.S.T.—NBC



Plan shows how G-E chargers can be located to charge electric truck batteries in their working areas. This saves time, labor and battery power usually wasted in returning trucks to a central charging station.

X marks the SPOT for a G-E BATTERY CHARGER

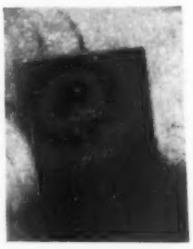
Gone are the days when it was necessary to ship electric trucks to a central charging station after long hauls or a hard day's work. Now you can charge batteries in truck working areas by simply "spotting" G-E Copper-oxide battery chargers at strategic locations where they are always ready to do a job. The savings in time, labor and battery power are obvious.

The charger is easy and economical to use. It's fully automatic so—all a user has to do is plug in the connections, turn on the switch and the charger does everything else. It shuts off automatically on completion of the charge and a built-in control prevents batteries from discharging back through the charger after the a-c current turns off.

There are G-E Copper-oxide chargers for lead-acid batteries, nickel alkaline batteries or combination chargers to accommodate both. G-E chargers have no moving parts other than the cooling fan hence, maintenance costs compared with other types of battery charging equipment are negligible. For full details write: Section A266-77, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC

LIFETIME GAGE BLOCKS

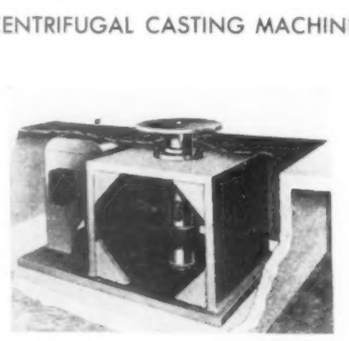


LIFETIME gage blocks are announced by DoAll Co., 1301 Washington Avenue So., Minneapolis, Minn. Long life and increased wearing qualities are made possible by use of DoAlloy, wear resistant alloy having expansion characteristics of steel. Life of new block is said to be 60 times that of steel blocks and 20 times that of chrome plated blocks. Blocks will retain their accuracies even though subject to temperatures of 120° below zero to 500° above zero. They are extremely acid resistant and will not discolor when subjected to many of the acids encountered in production. Blocks do not have to be degreased and regreased after use.

ANNOUNCE NEW DRY TYPE TRANSFORMER

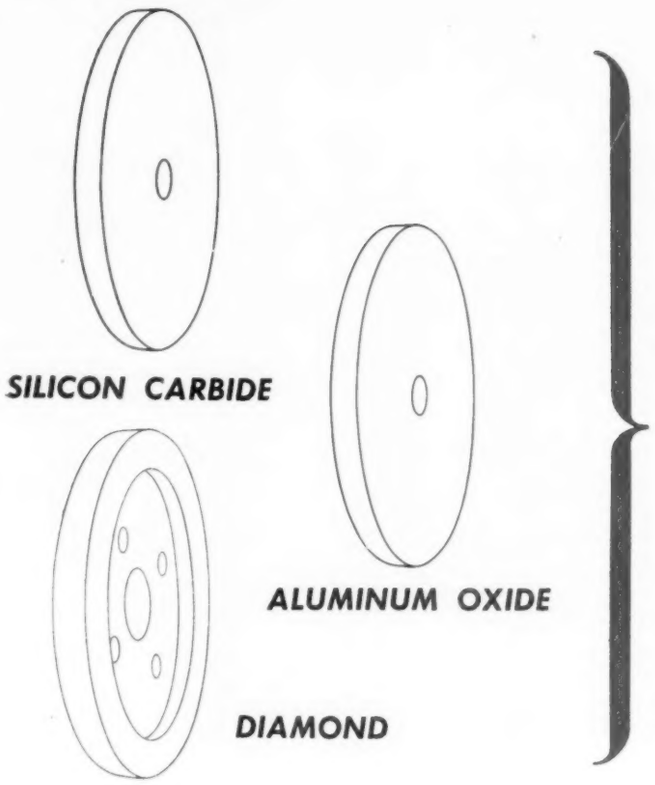
DEVELOPED during the war for marine use, a new dry type transformer up to 1/3 lighter and 1/3 smaller is announced by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., for correction of voltage conditions, distribution of power in new and expanded plants, and establishment of adequate secondary distribution. Compactness and light weight permit placing them on posts, walls, overhead, and on machines in a wide range of applications. Fireproof vaults are unnecessary inside building applications since no insulating liquids nor combustible materials are used. Complete details are given in Bulletin 6382.

CENTRIFUGAL CASTING MACHINE



MASTER model centrifugal casting machine, engineered and built for heavier off-balance loads, for continuous high production, and for free spinning power, is announced by the Centrifugal Machine & Engineering Co., 703 Jackson Court, Kalamazoo, Mich. Machine is so designed that standard 24" spinning head may be extended up to 60" in diameter by installation of adapter plate. Hub is heat-free and provides for continuous production operation with permanent molds attached directly to mounting plate. Several types of variable speed controls available. Electronic drives may be installed on custom-built casting machines.

(*Continued on page* 148)



What doesn't SCIENCE know about abrasives?

When you look back on what Science has discovered in the past few years to give you better grinding wheels, there is a temptation to think there is not much left to learn. Science however, never stops its endless search into the mysteries of abrasives.

In our own laboratory, engineers and chemists are daily studying grinding problems and Abrasive Products by CARBORUNDUM. As a result, some of the hard and fast rules of a couple of years ago regarding the choice of abrasives for grinding wheels are now outmoded.

There are many special conditions which can affect the choice of abrasive wheels. It's a costly practice to assume that what works best on one job will turn out as well on another.

A different recommendation can mean faster feed, or a more desirable finish. The change can show up in lower production cost.

Give your CARBORUNDUM salesman or our distributor's representative a chance to help on your wheel selections. He has the advantage of being part of a well-knit organization of experts whose experience comes from handling thousands of new grinding problems each year. Supporting each recommendation is the knowledge of skillfully trained engineers and laboratory technicians.

You can save time and trouble by asking a CARBORUNDUM representative's advice on grinding wheels. The Carborundum Company, Niagara Falls, N. Y.

A good rule for good grinding . . .

CALL IN CARBORUNDUM

TRADE MARK

ABRASIVE WHEELS
Silicon Carbide
Aluminum Oxide
Diamond

COATED AND BONDED ABRASIVES
Paper and Cloth Combination
Sheets, Rolls, Discs
Cylinder Hones
Sticks, Stones & Rubs
Specialties

ABRASIVE GRAINS AND COMPOUNDS
for:
Polishing
Lapping
Pressure Blasting
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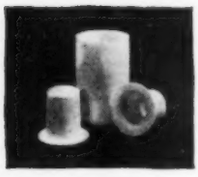
LAMINATED PLASTIC
SHAPES?



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SPECIALISTS in SHAPES laminated from resins and fabrics (glass, synthetic or cotton) to exacting needs of America's leading industrial engineers. Tell us your shape requirements. We probably can submit samples similar to your needs. Write to Andover Kent, New Brunswick, N. J. — TODAY!

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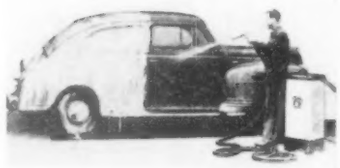
CAR SHAMPOO UNITS



SPECIALLY designed car shampoo units for fleet operators, are announced by Turco Products, Inc., 6135 So. Central Ave., Los Angeles, Calif. The unit is said to greatly increase wash-rack output and to provide a brighter finish than ordinary wash jobs. Unit is completely automatic proportioning and mixing device which blends the shampoo with water and air to produce effective foam. Trigger action control supplies either light or heavy cleaning foam, or air and water rinse from a single nozzle.

82-PIECE CARBIDE GAGE BLOCK SET

INTRODUCTION of 82-piece gage block set in carbide is announced by the Fonda Gage Co., 59 Daly St., Stamford, Conn., who state that laboratory tests indicate that the extent of wear of steel blocks in four months' service is scarcely to be expected on tungsten-carbide blocks in less than some 33 years of continuous use. Inherent stability of tungsten carbide prevents either growth or shrinkage during lifetime of blocks. Blocks have almost perfect finish of from .2 to .4 micro-inch r.m.s. The 82-piece set provides more than 480,000 combinations in wringing, as compared with 84,000 for 35-piece set.

HEAVY DUTY CLEANING UNIT

THIS is multiple-duty steam cleaning unit known as Oakite-Vapor Heavy Duty Cleaning Unit, developed by Oakite Products, Inc., 22 Thames St., New York, N. Y. It is a self-contained, downdraft flame, oil-fired, enclosed coil-type steam generator that delivers hot vaporized cleaning solutions under selective pressures up to 200 pounds, for the speedier, easier removal of grease, grit, grime, paint and other deposits from surfaces. Unit may be used on many types of light and heavy-duty cleaning. Wide range of fuel oils such as No. 1, No. 2 or No. 3 fuel oil, kerosene, gasoline may be used to operate the unit.

(*Continued on page* 152)

The Standard Man

will work for you without One Cent of Pay

The Standard Man, whether a direct representative of the factory or of a Mill Supply Distributor of Standard Shield Brand Drills, Reamers, Taps, Dies, Cutters and Special Tools, will go to work for you today in your own plant, and it won't cost you one cent. His first job will be to help you get in production fast with the right cutting tools. Usually he can select from a stock of thousands of Shield Brand Tools, the drills, reamers, taps, dies and cutters you need now.

His second job is to aid you in solving tough metal cutting problems. To accomplish this, he brings you our Company's 65 years of successful experience in supplying tools to meet the requirements of America's leading manufacturers in the railroad, farm implement, electrical, automotive and aviation industries.

Write today or call your Mill Supply Distributor and ask for the Standard Man — no obligation, of course.

Red Shield Brand
TWIST DRILLS
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SPECIAL TOOLS

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TO RELIEVE PRODUCTION PRESSURE . . .

STANDARDIZE

IF you are looking for additional time-saving methods to relieve production pressure, consider —

1. Time that can be saved in Purchasing Department
2. Time that can be saved in Stock Room
3. Time that can be saved in Tool Cribs
4. Time that can be saved in Machine Shop

by Standardizing on Standard Shield Brand Drills, Reamers, Taps, Dies and Milling Cutters. It adds up to an important total and thus contributes to faster production.

We can furnish your entire requirements promptly through leading Mill Supply Distributors in cities from coast to coast. Write us today for information.

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BRONZE VALVES with a Pedigree

The Powell Line of Bronze Valves for controlling intermediate steam, oil, water and gas is not an overnight development. Rather, it is a result of evolution through Powell's 100 years of practical, scientific progress in the art of valve-making.

Starting in the first generation with the celebrated "Star" Regrinding Globe Valve, invented and patented by James Powell, each succeeding generation of the Line has produced better and better valves. Today the nation-wide performance of Powell Bronze Valves definitely stamps them as "Valves with a Pedigree."

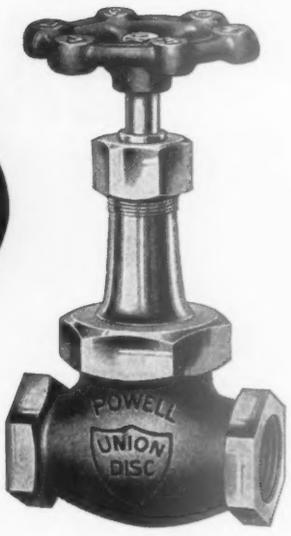


Fig. 150

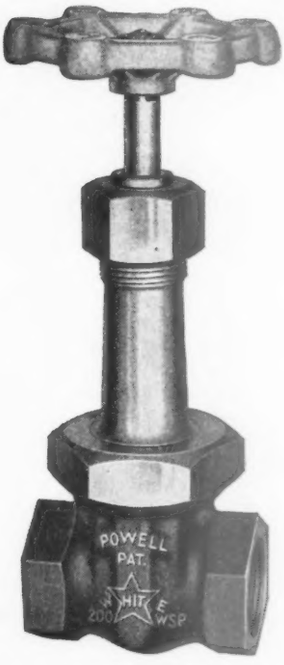


Fig. 375

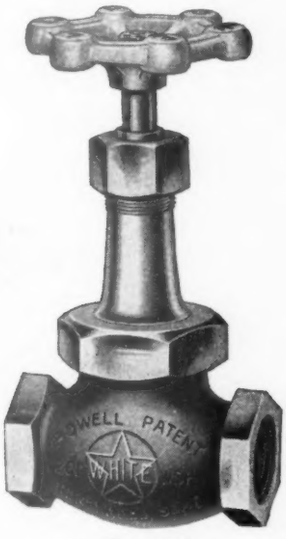


Fig. 1708

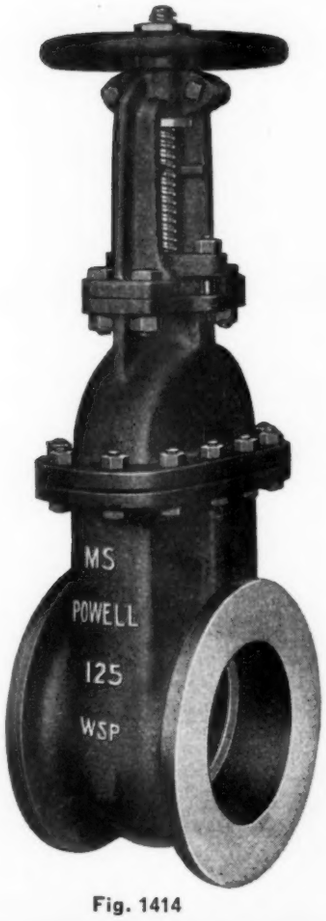


Fig. 1414

Fig. 500

Fig. 1414—125-pound Bronze O. S. & Y. Gate Valve with flanged ends.

Fig. 500—125-pound Bronze Gate Valve with screwed ends, inside screw rising stem and screwed bonnet.

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, inside screw rising stem, union bonnet, renewable seat and regrindable, renewable wear resisting semi-cone plug type disc.

Fig. 375—200-pound Bronze Gate Valve with screwed ends, inside screw rising stem, union bonnet and renewable wear resisting seat rings and disc.

Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

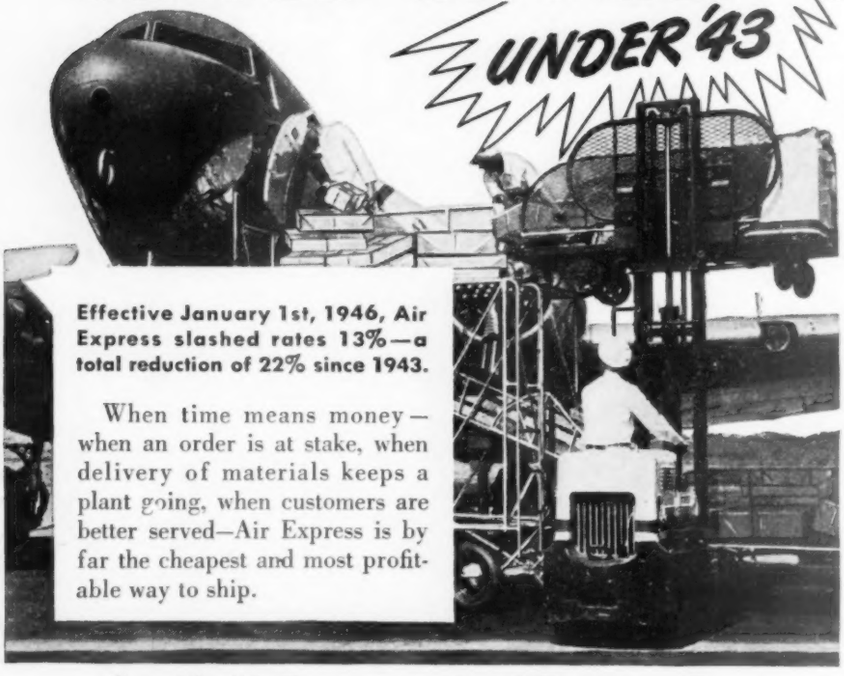
POWELL VALVES

SAVE TIME MAKE MONEY

SHIP by AIR EXPRESS

RATES CUT 22%

UNDER '43



Effective January 1st, 1946, Air Express slashed rates 13%—a total reduction of 22% since 1943.

When time means money—when an order is at stake, when delivery of materials keeps a plant going, when customers are better served—Air Express is by far the cheapest and most profitable way to ship.

Specify Air Express-a Good Business Buy

Shipments travel at a speed of three miles a minute between principal U. S. towns and cities, with cost including special pick-up and delivery. Same-day delivery between many airport towns and cities. Rapid air-rail service to and from 23,000 off-airline points in the United States. Service direct by air to and from scores of foreign countries in planes made in America, operated by American personnel and flying the U. S. flag.

HERE'S HOW LITTLE IT COSTS (U. S. A.)					
AIR MILES	2 lbs.	5 lbs.	25 lbs.	40 lbs.	Over 40 lbs. Cents per lb.
149	$1.00	$1.00	$1.00	$1.23	3.07
249	1.02	1.18	2.30	3.68	9.21
549	1.07	1.42	3.84	6.14	15.35
1049	1.17	1.98	7.68	12.28	30.70
2349	1.45	3.53	17.65	28.24	70.61
Over 2350	1.47	3.68	18.42	29.47	73.68

AIR EXPRESS

AIR EXPRESS

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Write Today for new Time and Rate Schedule on Air Express. It contains illuminating facts to help you solve many a shipping problem. Air Express Division, Railway Express Agency, 230 Park Ave., N. Y. 17. Or ask for it at any Airline or Railway Express office.

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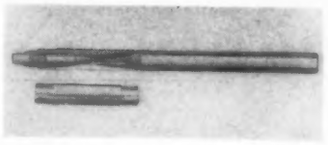
TOOL & DIE LAP



FLEXOLAP is the name of new type of lap designed specially for tool and die work by The Flexolap Mfg. Co., 2156 W. Fulton St., Chicago, Ill. Lap is adjustable with an expanding feature to provide for quick, easy take-up to maintain size and compensate for wear on the lapping barrel. It is flexible in that two types of finish may be obtained from the same barrel. Slots in barrel are milled off center and when turned in one direction the result is fast cutting action; reversed, end for end, the result is a smooth high polish. Laps are available with hard or soft barrel.

RAPID TEST CLIPS

RAPID test clips or connectors for various uses in the electrical field on bridges and test panels, for testing coils, transformers, condensers, resistors, fractional motors, and cable boards for rapid cable assembly have been developed by the Rapid Specialties Co., 329 West Huron St., Chicago 10, Ill. They are easy to install, easy to clean, positive connection, long life, take any size leads and will not injure the leads or harm operator's hands. Specifications — base ⅝" x ½"; height 1½"; material .051 polished brass; tension .016 phospher bronze spring. Base is drilled to take holding screws and terminals. Printed matter available.

ALL METAL WELDING HAMMERS

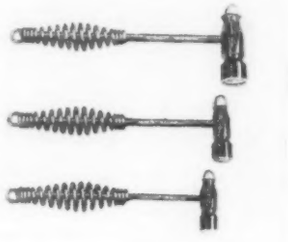


ILLUSTRATION shows all-metal hammers for the welding trade marketed by Atlas Welding Accessories Co., 14824 Wyoming Ave., Detroit, Mich. Heads are of flame hardened alloy tool steel, permanently attached to handle. Heads will not get out of alignment with handle. Balanced weight distribution makes for more "wallop" with less muscular effort.

(*Continued on page* 154)

Artist: Reg Massie, native of Chile

CHILE

Southernmost of United Nations—exchanges products in native packages for imports in modern containers. Our special staff of designers and engineers is prepared to develop exactly the right package for your product.

CONTAINER CORPORATION OF AMERICA
CHICAGO, ILLINOIS, AND 23 OTHER CITIES
SAVE WASTE PAPER

GENERAL PNEUMATICS

make light work of heavy material handling loads

● General Pneumatics give you swift, efficient, low cost material handling—manual or mechanized—because they speed light or heavy loads over any surface—avoid spilling and breaking cargo—end floor wear and reduce maintenance.

Industrial Pneumatic TIRE - TUBE - WHEEL UNITS
8" to 22" o. d. for loads of 180-1900 lbs. per tire

●

On equipment of the latest design you'll find Generals.

The extra capacity wide-base rim *originated* by General, has the *only* quickly demountable tire; permits low-bed heavy load truck design with a low center of gravity that provides positive stability, and straight tracking trailer trains.

Be sure of top efficiency—*specify* the General Industrial Pneumatic Tire on the new equipment you buy.

Dept. 3,* THE GENERAL TIRE & RUBBER CO. • *Akron, Ohio

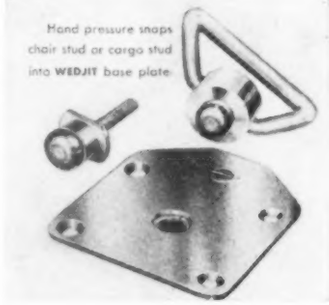
AUTOMATIC GAS GUN

THE Century gas gun is a self-lighting, self-extinguishing acetylene torch. The gas ignites with the pull of the trigger and extinguishes on its release, making for savings in gas consumption. Variations in flame, with a temperature range of from 950° to approximately 2,000° F. are obtained by adjusting pressure regulator. It is efficient torch for soldering, silver soldering, light brazing, aluminum soldering, sheet metal work, tinning, low-temperature, welding, etc. Century Aircraft Co., Inglewood, Calif.

MIDGET PNEUMATIC SCREWDRIVER

POWER screw driver designed especially for driving small screws, is announced by The Aro Equipment Corp., Bryan, Ohio. It is about the size and shape of the average cigar, and is the company's Model 7000. Its capacity includes screws from No. 1 to No. 6. It weighs 8 oz., and is 4⅞" long and ¾" in diameter. Starts automatically when tool is applied to work. It adjusts itself to driving conditions. It is also available with adapter socket for nut setting.

ALL PURPOSE TIE-DOWN



WEDJIT is the name of all-purpose Tie-Down developed by Adams Rite Hardware Mfg. Co., Glendale, Calif. Features are said to be ease of installation and ease of removal. Mounting plate may be drilled to any hole pattern. Tests are said to show that according to size, Wedjits can withstand from 500 to 5,000 lbs. ultimate vertical load. Base plates and studs can be modified to suit any fixture design. Present sizes range in weight from .07 to .25 lbs.

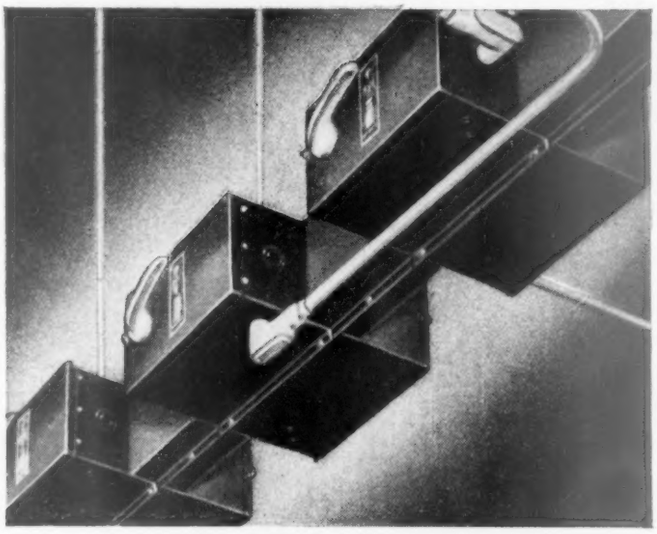
(*Continued on page* 156)

THE BIG 3 OF ELECTRICAL DISTRIBUTION

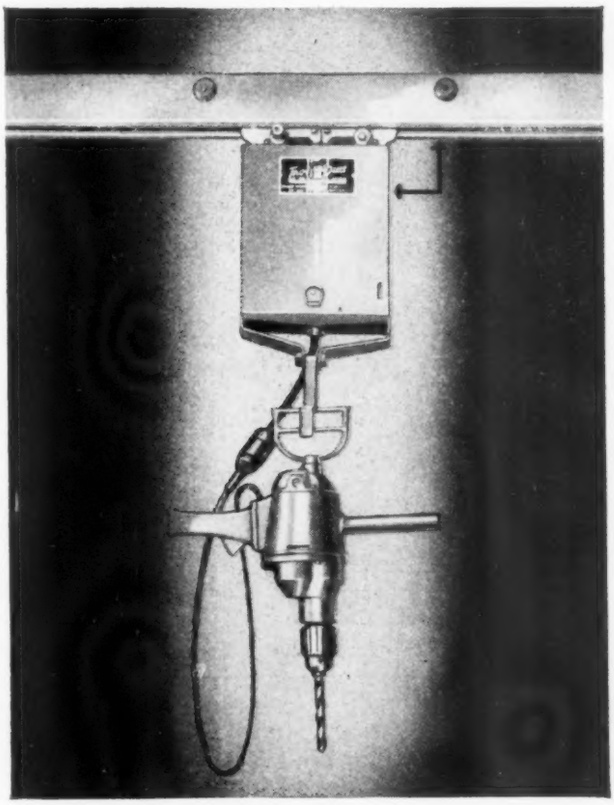
Meet the "Big 3" of electrical distribution: BullDog BUStribution DUCT, Industrial Trol-E-Duct and Universal Trol-E-Duct!

Recognized by industry as the most efficient systems of their type, these pioneers in the field of completely flexible and salvable electrical distribution systems are today saving countless hours on installation and maintenance — greatly reducing changeover time — helping to bring peacetime production to top speed and efficiency.

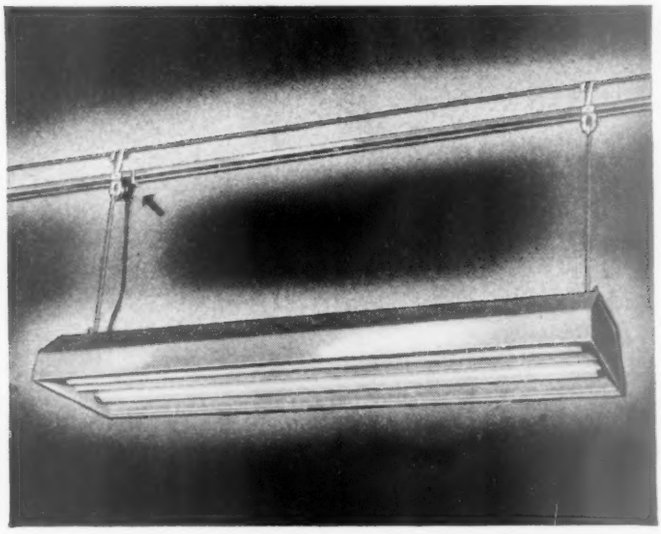
If you hope to successfully compete in the peacetime battle of costs ahead, it will pay you to investigate these superior BullDog Electrical Distribution Systems. Write now for complete details.



1 FOR PLUG-IN POWER, BullDog BUStribution DUCT which includes a variety of circuit protective tap-off Bus Plugs enables you to spot and plug-in plant machinery almost as readily as you plug-in your vacuum cleaner at home. No lost motion—no lost time! RATINGS: Plug-in Type up to 1350 Amps. Feeder Type up to 4000 Amps. 575 Volts or less.



2 FOR PORTABLE TOOLS, Cranes, Hoists or similar moving "loads" BullDog Industrial Trol-E-Duct supplies a source of safe, mobile power by means of Trolleys which, as they move through the elongated slot in duct, transmit current from the duct bus bars to the moving load. RATING: 90 Amps. 575 Volts or less.



3 FOR COMPLETELY FLEXIBLE LIGHTING, Universal Trol-E-Duct is a busway wiring system that can be tapped with Plugs or Trolleys at any point through the continuous slot in duct casing . . . Always keeps your lighting modern, for changes in type of fixture can be as readily made as changes in lighting positions. RATING: 50 Amps. 250 Volts or less.

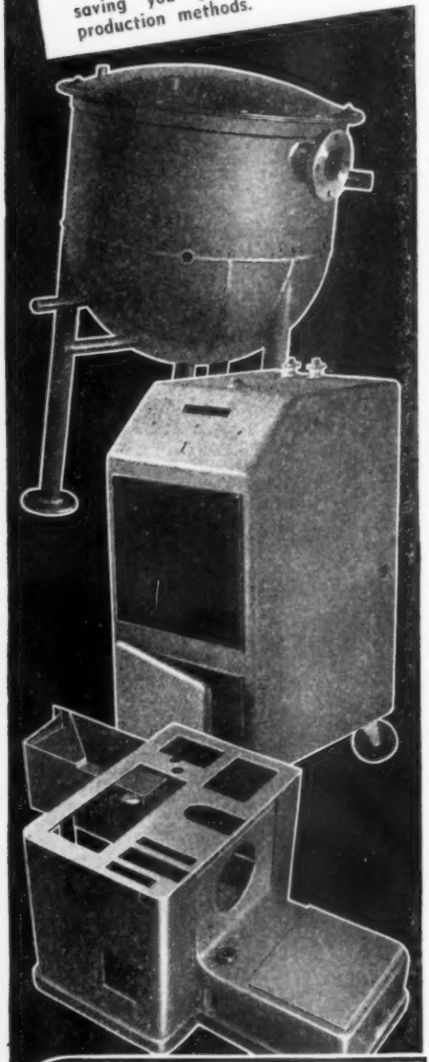
BULLDOG
ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN.
In Canada:
BullDog Electric Products of
Canada, Ltd., Toronto.
Field Offices in All Principal Cities

Manufacturers of
Vacu-Break Safety Switches — SafToFuse Panelboards — Switchboards — Circuit Master Breakers — BUStribution Duct, for "plug-in" power — Industrial Trol-E-Duct for moving "loads."

PLATE AND SHEET STEEL PRODUCTS MADE TO SPECIFICATIONS

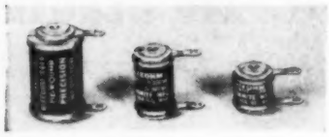
If it's quality products you want—then let Littleford experience and skill in fabricating plate and sheet steel be your assurance of securing exactly what is needed. Precision forming, bending, shearing and welding is why so many industries send specifications to Littleford's. When you need a special machine part, base, cabinet, housing, tank, etc., send blueprints to Littleford for an estimate of cost—see the saving you get through modern production methods.



LITTLEFORD

LITTLEFORD BROS., INC.
446 E. Pearl St., Cincinnati 2, Ohio

RITEOHM RESISTORS

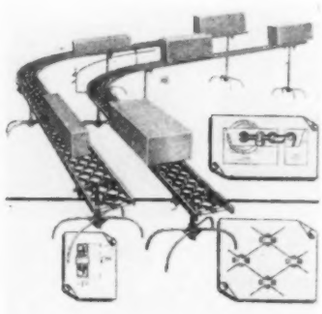


New Series 84 in types 844 B, 844 A, and 842A, is latest addition to Ohmite Riteohm precision resistor line. New series was developed to meet need for unit capable of being mounted by means of a through-bolt and equipped with radial lug at each end. The 84 is pie-wound to 1% accuracy and is available in 3 sizes — 9/16" diameter by 9/16" long, 9/16" x ⅞", and ¾" x 1-3/16". The smallest is a 2 pie while the other two are 4 pie units. Bulletin 126 describes these resistors.

AIR REDUCING VALVE

IMPROVED type of internal pilot operated air reducing valve, Class L-1A, is announced by Leslie Co., 121 Delafield Avenue, Lyndhurst, N. J. Features are said to be stability under all flow conditions, and responsive instant reaction to widest and most sudden variations in load. Plastic inserts in valve seats provide positive shutoff. Valve is available in sizes ½" through 4", incl., designed for initial pressures up to 400 air pressures and reduced pressures from 5 to 300 psi.

NEW TYPE CONVEYOR



LOAD-VEYOR is name of new line of materials handling equipment announced by Market Forge Co., Boston, Mass. Each 10-foot length weighs 58 lbs. Either side of Load-Veyor may be used —one side for moving large packages; the reverse for small packages. Accessories include 90° curve, 45° curve guard rails, adjustable stands, portable stands, reversible stand, package retarder and package stop. Portable stands are provided with 3" caster wheels. When suitably supported section will carry distributed load of 1000 pounds.

FOR REPLACING GASKETS

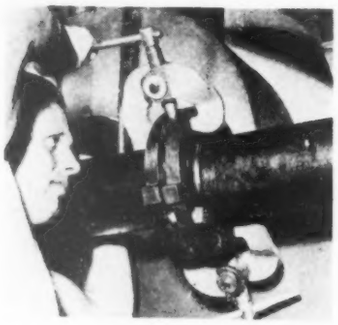
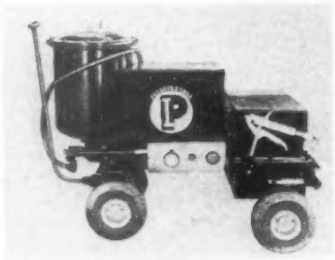


ILLUSTRATION shows flange jack for opening pipe flanges for gasket renewal, without damage to flange faces and without danger from sparks. It is made by the T. G. Persson Co., 224 Glenwood Ave., Bloomfield, N. J. Jack is capable of opening joints against a load of 15 tons. Flanges are said to open easily without shock. Standard size jacks open all 2" to 20" flanges, holding them in perfect alignment.

ANNOUNCE SAFETY SHIELDED ROTAMETER

FULL-view rotameter with safety shielding for accurate flow rate measurement and control is announced by The Brooks Rotameter Co., Lansdale, Pa. It is designed especially for tough service and corrosive conditions in the process industries. Safety-shielding is obtained by front and back safety glass windows ¼" thick. All surfaces are gasketed. Meter is available in sizes from ⅛" to 4". With metal tapered tube it can be used for pressures as high as 600 psi. It can be obtained as simple flow rate indicator or with remote instrument for recording or recording-controlling flow rate.

PORTABLE GREASING UNIT



THIS is a portable greasing unit announced by Pressurelube Inc., 609 West 134th St., New York, N. Y. Equipment can be supplied with a grease gun for every purpose and is available either with battery powered or gasoline driven motor. No electric cord or air hose is required. Unit delivers up to 12,000 lbs. steady pressure. Complete portability provides on-the-spot lubrication wherever required. Rolling stock of all description may be serviced without removing load, according to maker of unit.

(*Continued on page* 160)

DIAMOND G CONTROLLED TENSION SPRINGS

The useful life of a spring is the tension built into it. Tension that is exact for each requirement the spring is designed to fill . . . tension that will provide precise control in actual operation . . . controlled tension for better performance.

Every spring produced by Diamond G has Controlled Tension built right in it. Scientific design . . . exacting fabrication . . . precision heat treating and tempering assure Diamond G Springs of meeting the most rigid engineering specifications and tests.

The complete facilities of Diamond G for providing all types of coil and torsion springs offer you a ready source of supply and assure quick deliveries on all quantities. You name your need . . . we'll provide the spring.

GEORGE K. GARRETT CO., INC.

1114 MORRIS BLDG., 1421 CHESTNUT ST., PHILADELPHIA 2, PA.

MANUFACTURERS OF

DIAMOND G PRODUCTS

LOCK WASHERS • • FLAT WASHERS • • STAMPINGS • • SPRINGS • • HOSE CLAMPS • • SNAP AND RETAINER RINGS

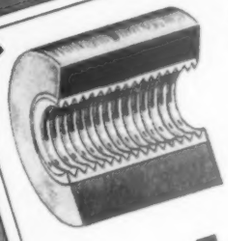
Notes on Molded Rubber Parts by ORCO

A

Avoid sharp corners in molded rubber parts. Sharp corners cause trouble in molding due to "feathering" of edges, trapped air, and difficulty of removing from mold or mandrel.

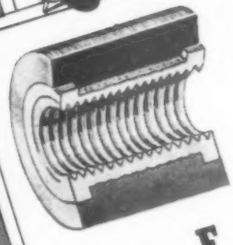
B

This is a definite improvement over "A". Note rounded edges. Unless requirements necessitate use of sharp edges on a molded rubber part, it is advisable to specify radii.



E

In producing this molded-in threaded metal insert, the rubber under pressure would flow around insert into the threads which would have to be cleaned after vulcanization.



F

An improvement over "E" as the heavier insert with end flanges minimizes possibility of rubber flowing into threaded hole. Also, the rough surface on outside of insert assures better adhesion.

C

To avoid tearing, holes for attaching molded rubber parts to other machine parts should be kept as far as possible from each other and from edges. Part "C" fails to meet these requirements.

D

This is an improvement over part "C". Note wider spacing between the holes and between the holes and the outer edges to minimize possibility of tearing.

Elementary? . . . perhaps . . . but failure to recognize such factors can cause premature failure of a rubber part or increase molding costs unnecessarily.

Nothing is "too elementary" at ORCO if it is a factor contributing to better performance, longer life, and lower costs of molded rubber parts for ORCO customers.

"ORCO-OPERATION"

BRANCHES: DETROIT • NEW YORK • CHICAGO
INDIANAPOLIS • CLEVELAND

THE OHIO RUBBER COMPANY · WILLOUGHBY, OHIO

In the manufacture of huge herringbone gears, accurate cutting would be impossible without careful temperature control by air conditioning and refrigeration.

They're doing "impossible" jobs with G-E Air Conditioning

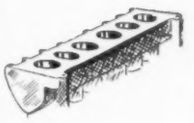
IN factories, in foundries, in mills throughout America, many an "impossible" job is rolling along smoothly . . . thanks to G-E Air Conditioning and Refrigeration.

Wherever temperature, humidity, or dust is a factor in your production processes, G-E Air Conditioning and Refrigeration may help eliminate "bugs", aid in precision work, prevent product deterioration.

Shown here are a few of the applications of air conditioning made by various industries. G-E know-how is available to you through your G-E distributor. He will be glad to consult with you on the installation of G-E refrigerating equipment in your plant. *General Electric Company, Air Conditioning Department, Section 6292, Bloomfield, New Jersey.*

GENERAL ELECTRIC

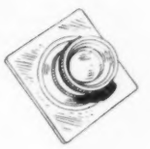
Air Conditioning



PRECISION BORING. Maintenance of constant temperature makes possible close tolerances.

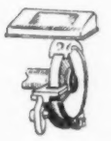
THROWING SILK. Weight and quality of silk maintained by control of humidity.

MAKING PRECISION INSTRUMENTS. Chronometers, aviation instruments, and other delicate meters made under controlled air conditions, show up better on test.



LENS GRINDING. Temperature control important to obtain accurate optical characteristics. Air conditioning prevents dirt and dust from entering lens system during assembly.

ELECTRICAL WINDING. Insulation-wrecking moisture is eliminated.



ABRASIVES. Proper temperature and humidity vital in maintaining quality control in manufacture and storage of abrasive wheels.

FILM MANUFACTURE. Freedom from dust plays an important part in manufacture and development of film. Temperature control vital in manufacture of raw film and necessary for quality in developing process.

FROM THE FILES OF "AMERICAN SWISS" FILE SERVICE

"Through the use of "AMERICAN SWISS" Swiss-Pattern Files, we have forgotten our file troubles".
from an accessories manufacturer

You, too, can eliminate file troubles . . . secure best results at least costs on your intricate and accurate filing work . . . by standardizing on "AMERICAN SWISS" Swiss-Pattern Files. The tough, strong metal . . . correct and uniform hardness . . . sharp, deeply cut teeth . . . long filing surface of these precision tools assure faster work, longer life, and lowest filing expense.

Furthermore, the large "AMERICAN SWISS" line assures an exactly suitable selection for each job, and each file is guaranteed to be perfect in every respect.

3000 Different Shapes Cuts and Sizes

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Buy from Our Distributor

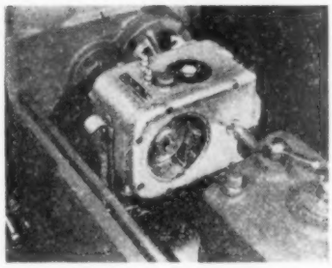
AMERICAN SWISS FILE & TOOL CO.
ELIZABETH 1 NEW JERSEY

ONLY THE BEST AND GOOD ENOUGH

ASK FOR THEM BY THIS NAME

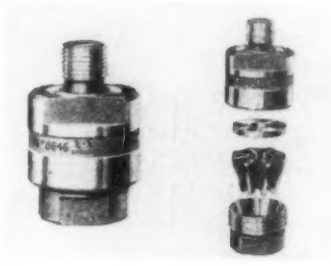
American Swiss
SWISS PATTERN FILES

DIAMOND DRESSING DEVICE



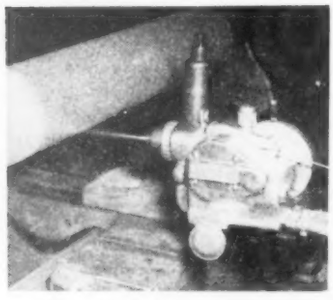
THE Sheffield Corp., Dayton, Ohio, states that many single point thread grinders can be converted to multi-ribbed wheel work by means of new semi-automatic diamond dresser illustrated. The unit is mounted between centers of the grinders and is actuated by the driving pin on the face plate. Precision ground cam for the required pitch is mounted upon lapped spindle and controls movement of a suitable diamond. Reciprocating movement of the diamond in conjunction with the uniform lateral motion imparted by the leadscrew results in desired wheel profiling action. Device is recommended for use on (a) work demand long lengths of thread; (b) thread gage grinding for elimination of thick first and last threads; (c) maintenance of minimum thread variation; (d) all fine pitch threads over 32 TPI; (e) where the wheel is to be dressed at the required helix angle; and (f) where it is desired to traverse grind and the sharp corner and small radii exceed the limits of crush dressing. The dresser makes possible the use of a multi-form wheel on single point thread grinders.

RUBBER-FLEX COLLLET



NEW type of heavy duty drill chuck in which a tough web of neoprene synthetic rubber keeps the jaws in better alignment and permits one chuck to take a wider range of drill sizes, has been developed by The Jacobs Mfg. Co., Hartford, Conn. The rubber is bonded to the steel jaws and passes through anchoring holes in them making a compact, conical unit. The collet is tightened by a screw mechanism which forces it into the funnel-shaped nose. When chuck is loosened for changing drills, the neoprene web pushes the jaws apart and releases the drill shank. It is stated that 12 of the collets and three detachable arbors will handle a range of operations that would require 300 ordinary single purpose collets. Models produced are for multiple spindle drilling machines.

HEAVY DUTY METALLIZING GUN

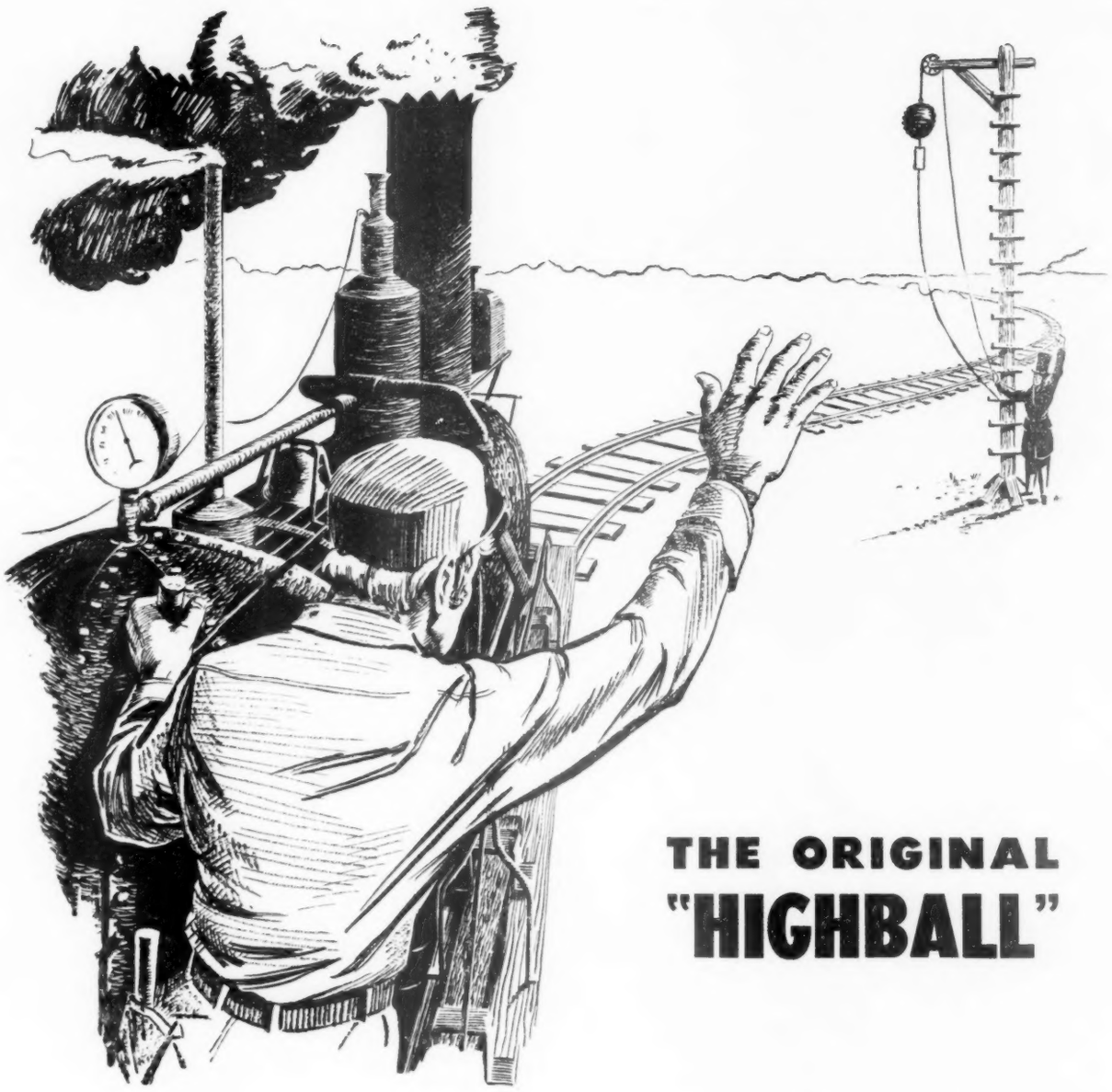


HEAVY-duty, continuous operation metallizing gun, known as the Type Y, is announced by Metallizing Engineering Co., 34-14 30th St., Long Island City, N. Y. Unlike the hand gun it is designed and built specifically for mechanical mounting and continuous operation. Features include the use of 3/16 inch wire —a revolutionary "first time" which, when combined with an acetylene pressure of only 15 psi, more than doubles any previous spraying speeds. Another feature is fluid lubrication and a built-in forced feed pump. Bulletin 49P describes new gun in detail.

USES COMPRESSED AIR

ILLUSTRATION shows breathing apparatus which has wide variety of emergency and general work applications developed by the Scott Aviation Corp., Lancaster, N. Y., that uses normal breathing air—air that is stored under pressure in compressed air cylinder. In the Air Service it was known as the "walk around bottle" for it permitted fiying personnel to leave their stations and take up other duties in the airplane. The Air-Pak utilizes the Willson mask with shatter-proof lenses cushioned in rubber. Fresh normal air prevents lens fogging, and exhalation valve prevents accumulation of gases inside the mask. Two types of compressed air cylinders are available, back pack (illustrated) and sling type, the latter being preferred for chemical laboratory work. The Scot Air-Pak is ready for instant use. No chemicals are required; no training is required. Heavy-duty cylinder contains 38.4 cu. ft. of air at 1800 lbs. pressure. Under normal working condition it will provide a one hour supply of fresh air. Sling type has life of 16 minutes. Printed matter available.

(*Continued on page* 162)



THE ORIGINAL "HIGHBALL"

A BALL-SHAPED BASKET, suspended from the top of a "lookout post," was the first *fixed* railroad signal in America. When low, it meant "stop;" when high, "the road is clear." The upright position of the modern semaphore, the up and down motion of the trainman's arm or lantern, and the expression "give him the highball" are direct descendants of this early system.

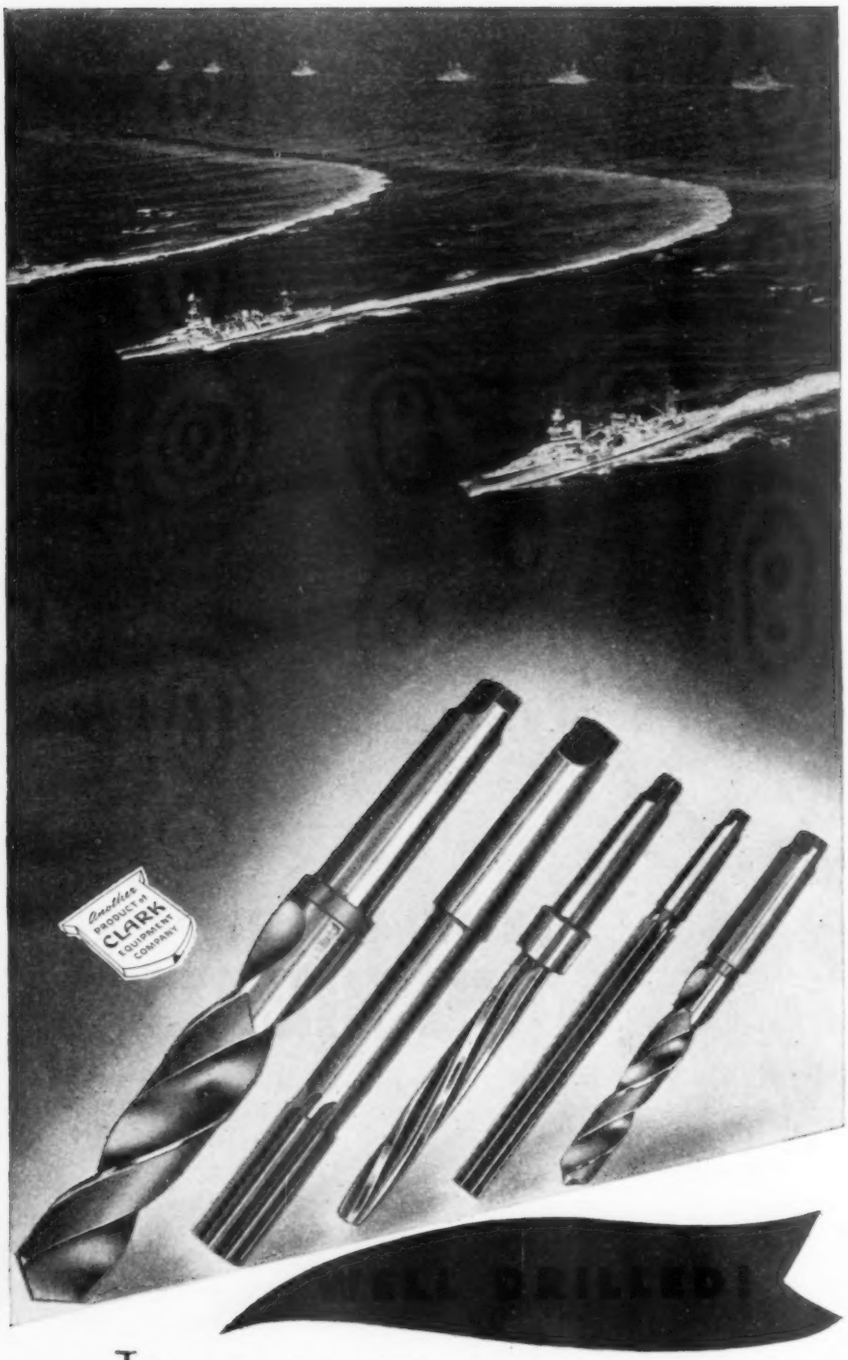
Not until electricity came to the railroads did automatic train control become effective. In 1891, two years before the first automatic, motor-operated semaphore was placed in service, Exides were being used by America's railroads. Today, thousands of track and signal circuits, on all major trunk lines, are powered by Exide Batteries. Exides also furnish power for railroad car lighting, air-conditioning, train telephones and other modern conveniences.

There are Exides for every storage battery need. Exides furnish motive power for the efficient, time-saving electrical industrial truck and for mine haulage units. Exides are used by central power stations, telephone and telegraph companies, radio stations, aircraft and steamship lines. And in millions of cars, trucks and buses, they continue to prove that "When it's an Exide, you start."

For 57 years the name Exide has stood for dependability, economy and long-life. Information regarding the application of storage batteries for any business is available upon request.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

Exide BATTERIES



IT is a sound practical guarantee of "well drilled" —the sturdy name Celfor.

First used by Clark, the famous Celfor process of forging drills into shape, then *twisting them hot,* preserves the heart and strength of the metal, uses that strength, produces tools unsurpassed for cutting accuracy, long life and low cost.

Every job is well drilled when you use CELFOR DRILLS and REAMERS.

CELFOR DRILLS AND REAMERS

CLARK EQUIPMENT COMPANY, Buchanan, Michigan

Products of CLARK • TRANSMISSIONS • ELECTRIC STEEL CASTINGS AXLES FOR TRUCKS AND BUSES • AXLE HOUSINGS • BLIND RIVETS INDUSTRIAL TRUCKS AND TRACTORS • HIGH-SPEED DRILLS AND REAMERS METAL SPOKE WHEELS • GEARS AND FORGINGS • RAILWAY TRUCKS

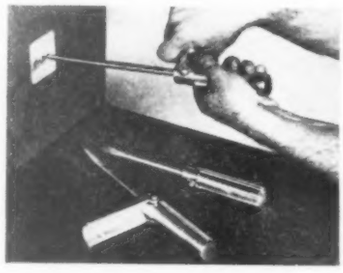
DESK VIEWER — 3¼" x 4¼"

COPELAND super-viewer announced by Barnett Optical Laboratories, 1218 Pratt Blvd., Chicago, Ill., is said to magnify with extreme clarity 2 x 2" and the larger 3¼" x 4¼" photographic transparencies. Images are free from color fringes, in what is termed a three-dimensional effect. Viewer is supplied with slide carriers for 2 x 2" and 3¼ x 4¼" slides. Rheostat permits variable lighting. Lighting system consists of 25-watt lamp backed by white reflectors.

SIGHT GRAVITY FEED OILER

SIGHT gravity feed oiler, with shut-off and needle valve adjustment is announced by Oil-Rite Corp., 3434 S. 13th St., Milwaukee, Wis. These lubricators are used on turret lathes, screw machines, milling machines, and other machine tools, engines, conveyors etc. Rate of oil flow can be regulated with an adjustable needle valve. Lock nut retains desired setting. Oil supply is always visible through heavy-wall Lucite reservoir. Glass reservoirs can be furnished for applications having temperatures exceeding 150 deg. F. Lubricators are available in 9 sizes with capacities ranging from ⅝ ounce to 1½ quarts. Printed matter available.

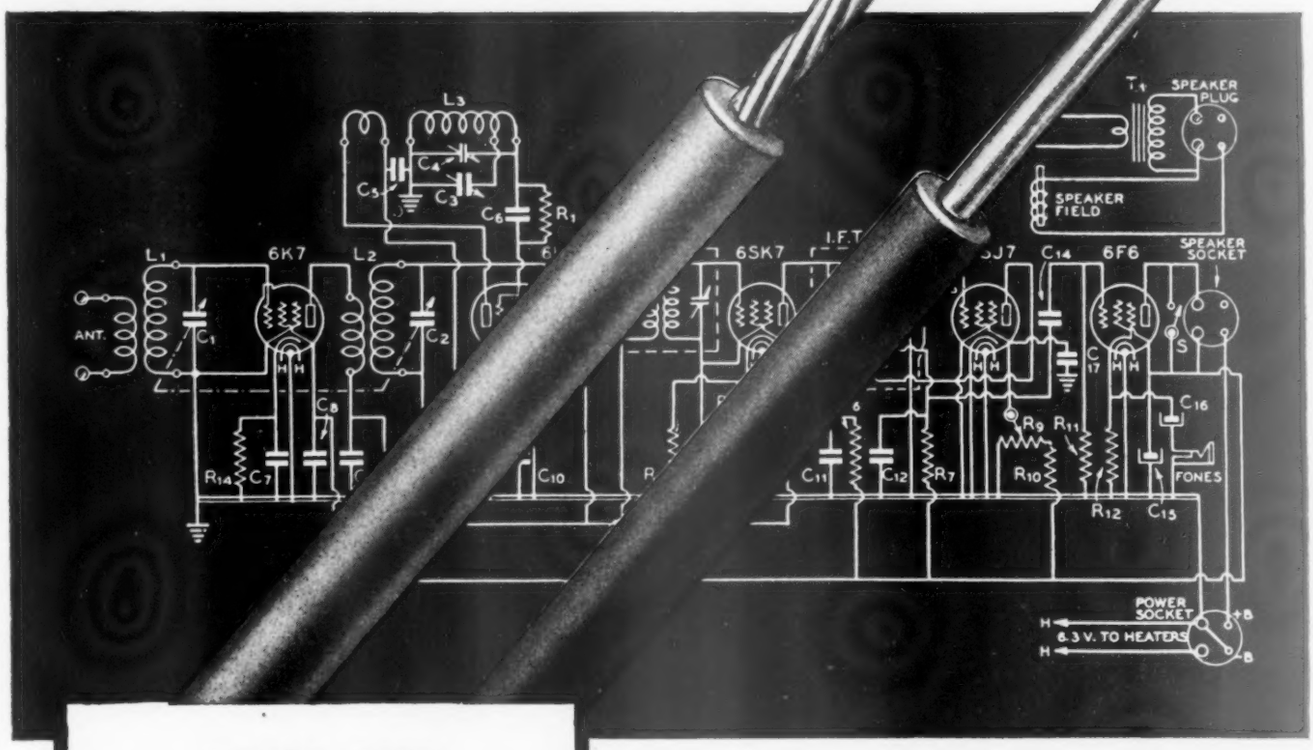
TRIPLE PURPOSE SCREW DRIVER



"TUFFY" is the tradename of this new triple-purpose screw driver tool with a "power arm" arrangement that gives extra power which makes possible the last quarter-turn pressure needed to tighten screws and make them stay-put, and which unlocks rusted screws. With the power-arm folded back into the handle, it becomes a standard type screw driver. Tool has aluminum handle; blade is drop forged steel, plated. It is made in 5" x ¼", 6" x 5/16", and 8" x ⅜" length blades. Swallow Airplane Co., Wichita, Kans.

(*Continued on page* 166)

Specify Federal RADIO HOOK-UP WIRE



LONG LIFE

FLAME RESISTANT

LOW MOISTURE ABSORPTION

RESISTS OXIDATION

HIGH DIELECTRIC STRENGTH

WIDE COLOR RANGE

THERMOPLASTIC INSULATION

FOR SUPERIOR QUALITY AND SERVICE

Federal's light-weight, pliable, thermoplastic insulated hook-up wire . . . fitted to your job . . . means better assembly with wire possessing superior dielectric strength and exceptional mechanical stamina.

Resistant to flame, moisture and oxidation . . . this tough but flexible thin-walled thermoplastic insulation covers all Federal's hook-up wire and combats aging, water absorption, abrasion, oils and greases.

Available in solid or stranded types . . . for high or low voltage needs in radio, electronics, appliances, communications, and allied fields . . . these labor-saving light-weight hook-up wires come in 14 brilliant colors and range in size from 24 to 14.

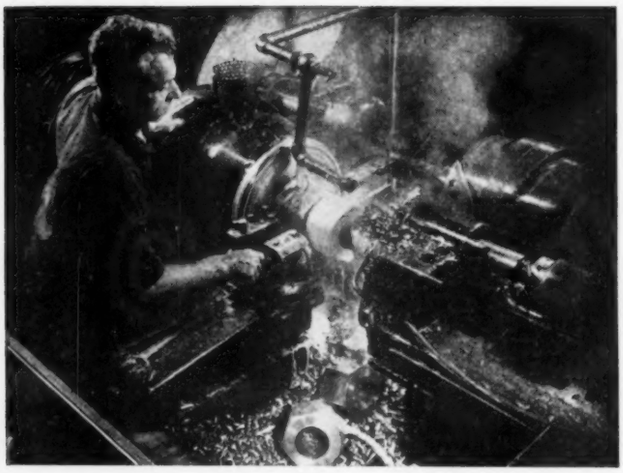
Whether your needs be large or small, get complete details . . . write to Federal now.

Federal Telephone and Radio Corporation

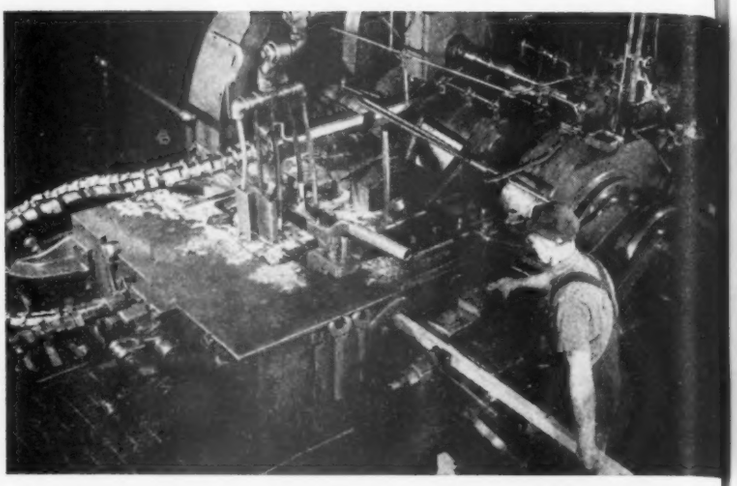
Export Distributor:
International Standard Electric Corporation

AN IT&T ASSOCIATE

Newark 1, N. J.

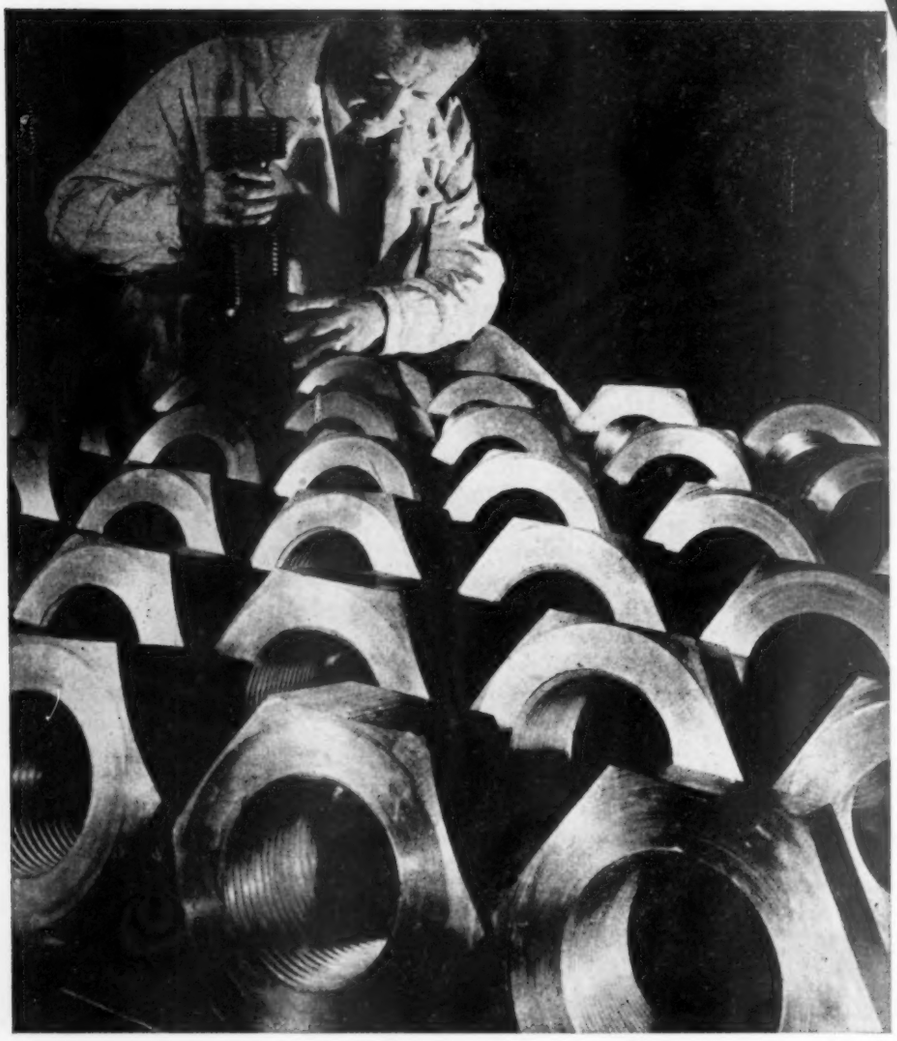


LARGEST NUTS—EMPIRE Nuts larger than 1½" bolt size are produced on machines of this type, especially adapted to RB&W requirements. Sizes up to 6½" across the flats are processed.



WORLD'S LARGEST—This cold-punching machine, fed rectangular bars, punches the hole, cuts the blank, chamfers, retrims, repunches to clear and center the hole, burnishes the sides — everything but tapping.

We spent millions . . .

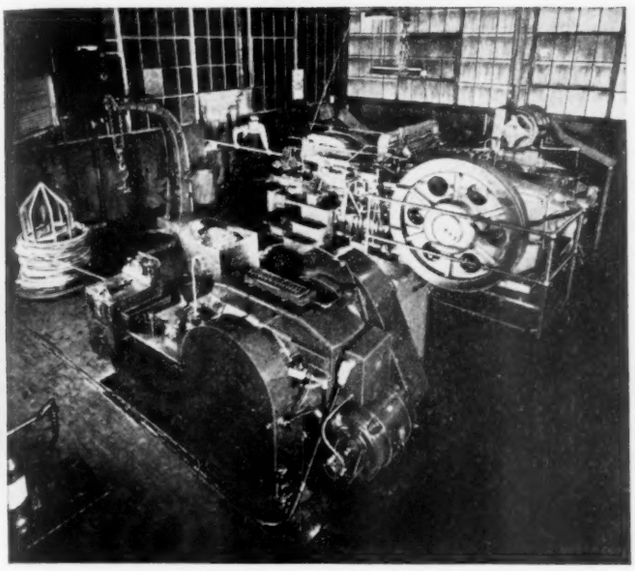


ACCURATE BEARING—RB&W Semi-finished Nuts have an accurate bearing surface at right angles to the axis of the thread. Special facing equipment and quality control insure satisfaction.

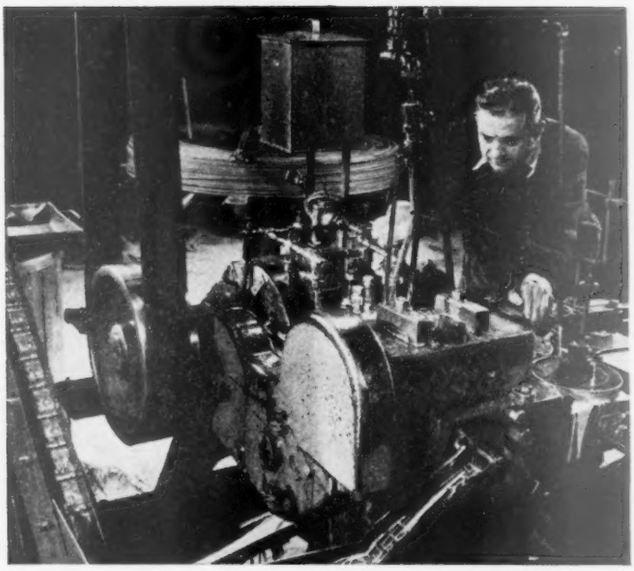
TO SAVE YOU MONEY

You pay no more for RB&W EMPIRE Nuts, when you buy their superior strength, accuracy and finish . . . and you also get freedom from assembly trouble and the permanent dependability assured by the millions RB&W has invested in special equipment and quality control.

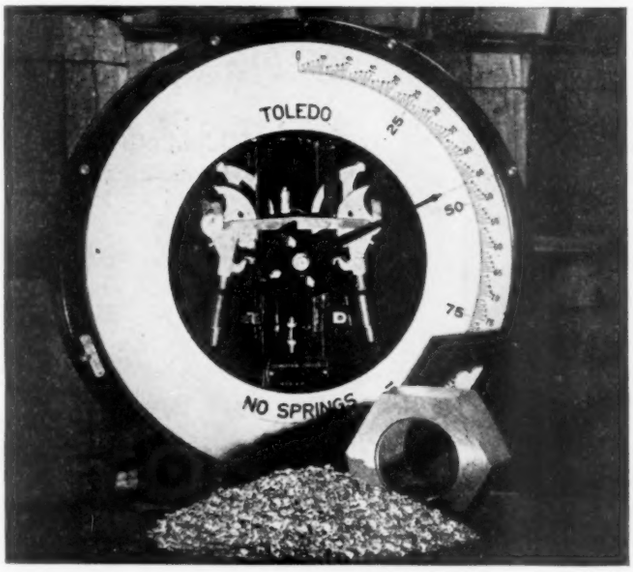
Quality control is found in actual processing as well as in the laboratories and inspection departments. For example, the method of cold-punching which RB&W developed has the valuable asset of insuring continuous inspection as part of the manufacturing process. Faulty bars cannot escape detection . . . the nuts must be uniform in size . . . and the hole must be central and concentric after repunching.



NEWEST MACHINES—RB&W works constantly to develop and perfect new processes. These machines are radically different in design and principle . . . are the only ones of their kind in the world.



HIGHEST SPEED—One thousand ¼-inch Square Nuts a minute is the pace of this machine which eats up a ton of steel every three hours. The raw material is cold-rolled in RB&W's own bar mill.



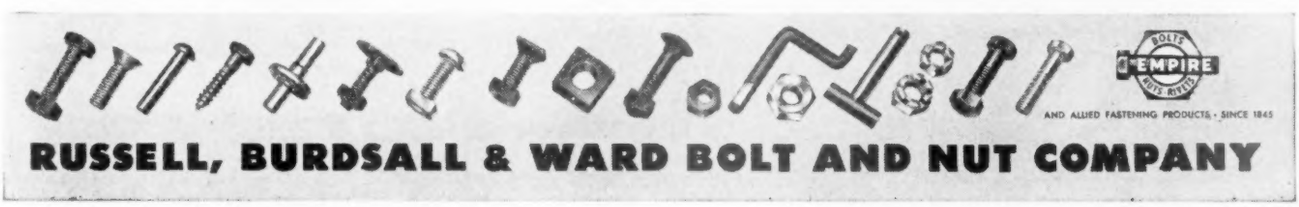
WIDE RANGE—RB&W produces light, regular and heavy nuts, hot-pressed, cold-punched, semi-finished and slotted. The 11,040 6-32 nuts in the pile are equal in weight to the single 4" nut.

LARGEST PLANT—RB&W's Coraopolis (Pa.) plant is the world's largest devoted exclusively to manufacturing cold-punched nuts. Several millions of nuts are produced and shipped each day.

RB&W The complete quality line

101 YEARS *Making strong the things that make America strong*

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. *Sales Offices at:* Philadelphia, Chicago, Chattanooga, Los Angeles, Portland, Seattle. *Distributors* from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also, the industry's most complete, easiest-to-use catalog.



RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

HERE *you need an*

ARMOURCLAD FIBRE COMBINATION DISC!

Faster-working Armour Abrasives Mean More Production

In the days ahead, competition will be keen. To get increased volume you'll need the fastest tools and the best abrasives possible.

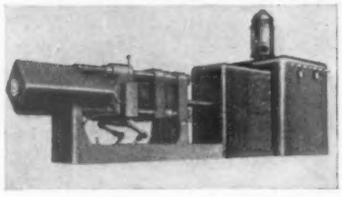
For better, faster finishing there are *specialized* ARMOUR ABRASIVES *designed* to do a *better job at less cost.* The faster, sharper, cooler-cutting *Armourclad Fibre Combination Disc* is only one of Armour's *complete* line of better metal-working abrasives.

It will pay you to call on Armour's experienced technicians. They will gladly help you choose the abrasives and methods which do your jobs best.

ARMOUR *Sandpaper* WORKS

DIVISION OF ARMOUR AND COMPANY
1355 West 31st Street • Chicago 9, Illinois

DIE CASTING MACHINE



HEAVY duty die casting machine is announced by the H. L. Harvill Mfg. Co., Box 335P, Los Angeles, Calif. It is a high capacity cold chamber type of machine with provision for the addition of a hot chamber furnace and an injection attachment so that the machine also may be used for automatic high speed casting of zinc, tin or lead alloys. This new series is offered in three sizes. Hydraulic pressures range from 200 psi to 1000 psi and delivery may be regulated by operator dependent upon pressure requirements of job. When using largest size cylinder assembly, a maximum of 10 lbs. of aluminum alloy or 33 lbs. of brass may be cast; when using standard size cylinder assembly for maximum pressure, a maximum of 1.7 lbs. of aluminum or a maximum of 5.6 lbs. of brass may be used. Printed matter available.

PHOTOELECTRIC CONTROL DETECTS SMOKE

PHOTOELECTRIC system developed by Photoswitch Inc., Cambridge 42, Mass., detects the presence of smoke in air conditioning ducts and immediately sounds alarms, turns off blowers, operates automatic dampers, or provides whatever other type of indication or control is required. The system consists of photoelectric control type A26X and light source type L11RX. Latter may be mounted to project a beam of light over any distance from 10 to 25 feet to the "eye" of the photoelectric unit. Intensity of light beam may be set so that control will respond to smoke of any predetermined density. Units are available either in Underwriter-approved explosion-proof housings for mounting in Class 1 Group D hazardous areas or in weather-proof pressed steel housings. Current or tube failure will cause the control to operate as though the light beam were interrupted.

WHICH OIL DO YOU USE?

I JUST LUBRICATE
A LAZY OIL THAT DOES ONLY ONE JOB?
-OR HARD-WORKING TALPEX THAT LUBRICATES AND DOES 4 EXTRA JOBS?
CHASES AWAY CARBON AND LACQUER
DISCOURAGES SLUDGE
HELPS CUT ENGINE WEAR
IS NON-CORROSIVE

An oil that merely lubricates—or that does only one or two of the other critical jobs in your engines—is a lazy oil. With today's operating conditions . . . the high cost of repairs . . . the scarcity of good spare parts . . . you simply can't afford to use a lazy oil.

To get the utmost in performance from your engines, use hard-working Shell TALPEX. This versatile oil has *all* the properties needed to do the many critical jobs necessary to keep your engines running smoothly and efficiently under the most severe operating conditions.

SHELL TALPEX

1. Has high detergency. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.
2. Has exceptional Oxidation Stability. Holds to a minimum the formation of sludge, lacquer and other products of deterioration.
3. Has low Carbon-Forming Tendency. Reduces ring sticking and wear. Lengthens engine life.
4. Is non-corrosive to alloy bearings. Protects all lubricated engine parts against corrosion.

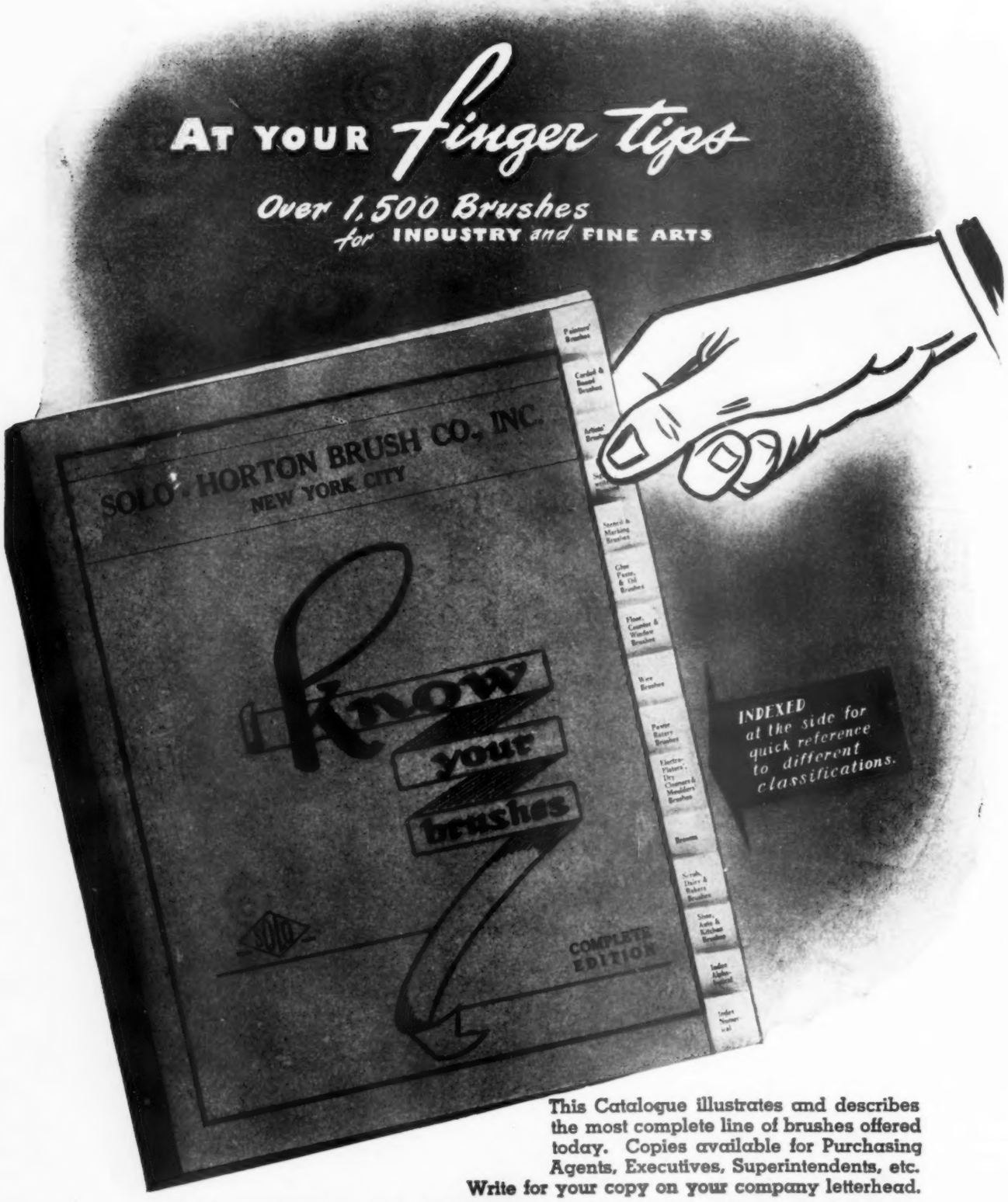
If the oil you now use is not doing all these jobs, it's lazy—should be changed to hard-working Talpex. Ask the Shell man to show you why.

SHELL

TALPEX

THE ALL-PURPOSE, HEAVY-DUTY LUBRICANT

for trucks, buses, tractors, shovels, stationary and marine Diesels.


AT YOUR finger tips
Over 1,500 Brushes
for INDUSTRY and FINE ARTS
SOLO-HORTON BRUSH CO., INC.
NEW YORK CITY
know your brushes
COMPLETE EDITION
INDEXED at the side for quick reference to different classifications.

This Catalogue illustrates and describes the most complete line of brushes offered today. Copies available for Purchasing Agents, Executives, Superintendents, etc.
Write for your copy on your company letterhead.

THE SOLO-HORTON BRUSH CO., INC.
135 WEST 19TH • Dept.A-1 • NEW YORK CITY 11

Clubs and bag, courtesy
A. G. Spalding & Brothers, Inc.

WHICH CLUB OFF THE TEE?

DRIVER, BRASSIE, SPOON . . . or perhaps even a "5" iron, you choose your club according to the shot you wish to make.

Today it's much the same with aluminum: You choose the alloy, temper and form best suited to each specific job.

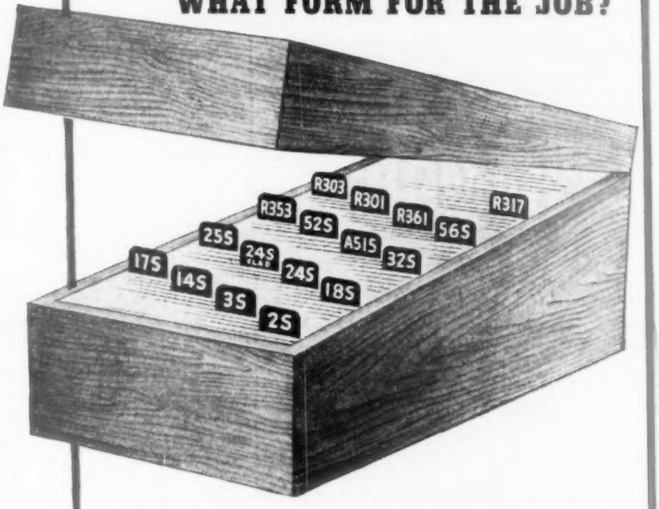
For example, to manufacturers of certain products, high unit-strength is a vital factor. To others, lightness may be even more important. Still others may require superior adaptability to forming or corrosion-resistance; or a combination of qualities.

Use of the *right* aluminum alloy means a better, more serviceable product at lower cost. Reynolds will help you specify it.

Consider Aluminum . . . Consult Reynolds

Whatever your interest, Reynolds technicians are ready to cooperate with your engineers. Offices in principal cities. Phone nearest office or write Reynolds Metals Company, Aluminum Division, 2525 So. Third St., Louisville 1, Ky.

WHAT ALLOY? WHAT TEMPER? WHAT FORM FOR THE JOB?



Match the alloy to the job, obtaining the temper needed in the form best adapted to your production. Result: a better product at lower cost.

REYNOLDS METALS

REYNOLDS ALUMINUM

The Great New Source of

INGOT · SHEET · SHAPES · WIRE · ROD · BAR · TUBING · PARTS · FORGINGS · CASTINGS · FOIL · POWDER

PROMPT DELIVERIES NOW!

Despite the tremendous demand for "Duet" we are finally caught up due to further production expansion. Thanks for your past forebearance.

"DUET"
2 WAY CLEANING HARMONY!

Absorbs and Washes
LIKE A
SPONGE

Used WET,
DAMP or DRY

NO OTHER CLOTH LIKE IT!

Cleans, Dries and Polishes
LIKE A
CHAMOIS

Owing to AMAZING AMOUNT of WATER it HOLDS, "DUET" can be used as a Sponge . . . or wrung out tightly, like a Chamois.

Ideal for HEAVY DUTY work in industry. *CANNOT UNRAVEL.* Each thread locked by a hidden stitch. EXTRA DENSE, long-wearing surface. SAVES MONEY. Used dry its dense surface picks up dust like a magnet.

ANOTHER PRODUCT OF
AMERICAN SPONGE & CHAMOIS CO., Inc.
47 ANN STREET, NEW YORK 7
245 MISSION STREET, SAN FRANCISCO 5
Producers of
AMSCO CHAMOIS and MERMAID SPONGES
EST. 1869 DEMAND BY BRAND

ICELESS CORRUGATED SHIPPER FOR FRESH FISH

"Has wonderful possibilities!"—those are the words a Wayne University, Detroit, scientist, Dr. Spencer A. Larsen, uses in referring to a new type of corrugated box, and a new method of packing, used in connection with the recent transporting of several test shipments of Great Lakes whitefish from Detroit to Washington via PCA (Pennsylvania-Central Airlines) Capitaliners. The box, especially created for the air experiments in the Package Laboratory of the Hinde & Dauch Paper Company, Sandusky, Ohio, is described by its maker as "a corrugated shipping carton designed to keep fish fresh while in flight without the aid of ice or other refrigerants."

Before each of the several test shipments, the dressed fish were precooled to a temperature of approximately 33 degrees F. They were then wrapped in Pliofilm, a transparent, light-weight, skin-like covering which helped retain the low temperature of the fish, and prevented moisture loss during air transit. This done, the fish were placed in

Ralph Starkey (left) director of PCA Air Cargo Sales, and Dr. Ira N. Gabrielson, director of Dept. of Interior's Fish and Wildlife Service, inspect iceless shipments of fish.

the inner one of two corrugated boxes, which together make up what Hinde & Dauch calls on INSULPAK.

The space between the inside and outside corrugated shipping boxes is filled with an inch thick patented material known as Thermocraft. It is this material that acts as a highly satisfactory insulator. The inner corrugated box is lined with a Pliofilm envelope which, after receiving the seafood is heat sealed to prevent moisture from getting to the inner box and thereby lessening its insulating efficiency.

Two sizes of the new-type iceless seafood cartons were used for the air cargo experiments. One of the boxes, approximately 18 inches long x 14 inches wide x 11 inches deep, accommodates 40 pounds of fresh fish, while the larger size box, approximately 30 inches long x 13 inches wide x 11 inches deep, has a 60 pound capacity. Both boxes are of such convenient size and capacity as to be easily handled by one man.

Extreme light weight characterizes both size packs. The 40 pound capacity pack weighs but 4½ pounds complete with insulation — the 60 pound capacity carton weighs only 6 pounds. Thus, complete packaging for 100 pounds of fresh fish, packed for air transit, necessitates only 12 pounds of packaging material — as compared with 75 pounds normally used for surface transportation. Obviously, this represents about an 80 per cent reduction in the weight of the package — a mighty important advantage in air shipping. Packaging costs—always an important item—are so low as to be startling. The 40 pound capacity carton shows the cost of the shipping box and innerlining envelope to be approximately $ .01 per pound of seafood shipped, while the cost of the 60 pound capacity carton is approximately $ .013 per pound of seafood shipped.

So successful are these new-type corrugated fish boxes that temperature readings taken at both ends of the Detroit-Washington experimental flights showed an average rise of only one-half of one degree per hour, or a total rise of only 3 degrees for the entire trip. Since the fish were cold (33 degrees) to begin with, this slight rise in temperature during the trip is insignificant.

NEW PORCELAIN ENAMEL

The O. Hommel Company of Pittsburgh has announced the development of a new porcelain enamel, "Tite-Wite". According to Ernest Hommel, president, it will make possible the use of porcelain enamel on many additional products that have heretofore not been finished with porcelain enamel.

Tite-Wite is described as a super opaque white cover coat in both regular and acid resisting porcelain enamels. It can be applied nearly as thin as the best organic paint finishes. Tests show reflectance readings of 75 to 80% and over when applications of 15 to 20 grams per square foot are applied.

It is claimed that the new enamel will materially reduce production costs and will permit more extensive and successful use of porcelain enamel on new products, as the thin application practically eliminates chipping.

"Tite-Wite" offers a porcelain enamel with bonding strength and opacity never before available to the refrigerator, stove, washing machine, kitchenware, sign and architectural industries.

COOLING A MOTOR WITH GASOLINE

Motors some times find themselves in strange environments. One motor developed by Westinghouse to drive a booster fuel pump for a jet-propelled plane will be mounted in the fuel-tank itself. The motor is made explosion-proof. The fuel, gasoline or kerosene, is circulated between an outer housing and the frame to keep the motor cool. The motor develops 2¼ hp at 8000 rpm, but weighs less than 20 pounds.

Black & Decker
7" Heavy-Duty Sander
$65
7" Standard $53

Do All This with One Tool

The Black & Decker Portable Electric Sander is more than a Sander! It's also a Grinder . . . a Wire Brusher . . . a Planer . . . a Surfacer. It drives a wide variety of attachments to make quick work of a tremendous variety of jobs.

With abrasive discs in 19 different grains, it sands and finishes any surface. With Wire Cup Brushes, it takes off old paint, rust and scale . . . cleans castings, tanks, boilers, vats, sheet metal and soldered joints. With saucer or cup-type grinding wheels, it removes metal . . . smooths welds and casting ridges . . . grinds off old rivets, studs and bolts . . . sharpens stationary machine blades often better than a Portable Grinder. With rotary gouging and planing heads, it shapes and semi-finishes lumber, removes stencil and brand marks from barrels and boxes . . . faster, cleaner, more uniformly.

Exceptionally heavy demand still keeps the supply of these sanders tight . . . so, to insure the earliest possible delivery, place your order with your Black & Decker Distributor now . . . they're worth waiting for. For our catalog—containing details on Black & Decker Sanders, Grinders, Drills, Saws and over 100 other Portable Electric Tools—write to: The Black & Decker Mfg. Co., 664 Pennsylvania Ave., Towson 4, Maryland.

Sands any Surface

Speeds Wire Brushing

Shapes All Timbers

Grinds any Metal

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

"SURE! WE'LL GET
G-E WATCH DOG STARTERS

For ALL Our Fluorescent Lamps"

Naturally, the maintenance chief is pleased that his boss will order G-E Watch Dog Starters for the plant's fluorescent lighting system. It simplifies his job of keeping all the fluorescent fixtures at a high peak of efficiency.

It means that his men can service fluorescent fixtures without any fussing and in much less time. When a lamp goes dead, the Watch Dog locks it out of the circuit, and all the maintenance man has to do is remove the dead lamp, press the reset button on the starter, insert the new lamp.

There's no delay in checking to see if the starter has to be replaced—or if the ballast has been overheated—the Watch Dog protects itself and other equipment.

The Watch Dog pays other dividends. It's a precision starter—it eliminates the annoyance of dead lamp flickering—it conserves electricity by locking dying lamps out of the circuit—IT STARTS FLUORESCENT LAMPS PROPERLY AND STOPS THEM WHEN THEY SHOULD BE STOPPED. It's the starter you should buy for ALL your fluorescent lamps.

Write for our free catalog, "How to Use Fluorescent Accessories for Best Lighting Results." Address request to Section G262-77, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Conn.

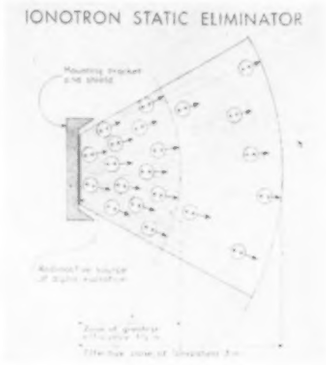
GENERAL ELECTRIC

MACHINERY AND MATERIALS FREED OF STATIC ELECTRICITY

Efficient, economical elimination of static electricity from machinery and from moving paper, plastic sheeting, textiles, and other materials is made possible with a new device, called the Ionotron static eliminator, developed by United States Radium Corporation, 525 Pearl Street, New York. The device has no moving parts and requires no electrical connections.

A continuous source of alpha radiation from a radioactive surface, in the form of a long, narrow strip, ionizes the surrounding air up to a distance of three inches from the surface. Effectual removal of static electricity within this zone is permanently assured in all applications, because the radioactive strength of the active element decreases only 50 per cent in some 1600 years.

E. B. Fisher, vice president of United States Radium Corporation, reports that research and special wartime applications indicate its wide-spread adoption by



industry for eliminating production problems due to static and for safeguarding hazardous processes where static is a possible cause of ignition of flammable solids, liquids, or gases.

The static-neutralizing element consists of extremely thin metallic foil, incorporating a radioactive substance and welded to a nonradioactive, metallic backing. The foil serves as a mechanical bonding medium for the radioactive material and acts as a seal to prevent escape of radon gas. The construction is such that alpha radiation is emitted directionally, creating an ionized zone in the region of the electrostatic charge. The assembly is mounted in a housing designed to provide adequate shielding and can be supplied, within limits, in forms or shapes to meet special requirements.

1 1 1

DOALL DEVELOPS ONE-MAN MACHINE SHOP

A model machine shop suitable for one-man operation which can be housed in the back of a store, a two-car garage, or even in a basement, is being exhibited by The DoALL Company of De Plaines, Illinois, and Minneapolis, Minnesota, at the Des Plaines DoALL plant, 264 North Laurel Avenue.

(*Continued from page* 176)

Don't leave it to chance

IN POKER — the odds are 64,973 to 1 against receiving *a royal flush;* 4,164 to 1 against *four of a kind;* 693 to 1 against *a full house;* 254 to 1 against *a straight;* 1.37 to 1 against *a pair.*

LEAVE IT TO — HY-TEST

THE SAFETY SHOE WITH THE ANCHOR FLANGE STEEL BOX TOE

...This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting and tilting when toe is struck at an angle.

The Anchor-Flange Steel Box Toe certainly places all the odds with Hy-Test Safety Shoe wearers. This rugged shield of tough, lightweight steel is scientifically designed to stand up under greater pressure . . . harder impact. Because of this Anchor-Flange Steel Box Toe hundreds of workers who might have been crippled for life are walking in perfect foot health today.

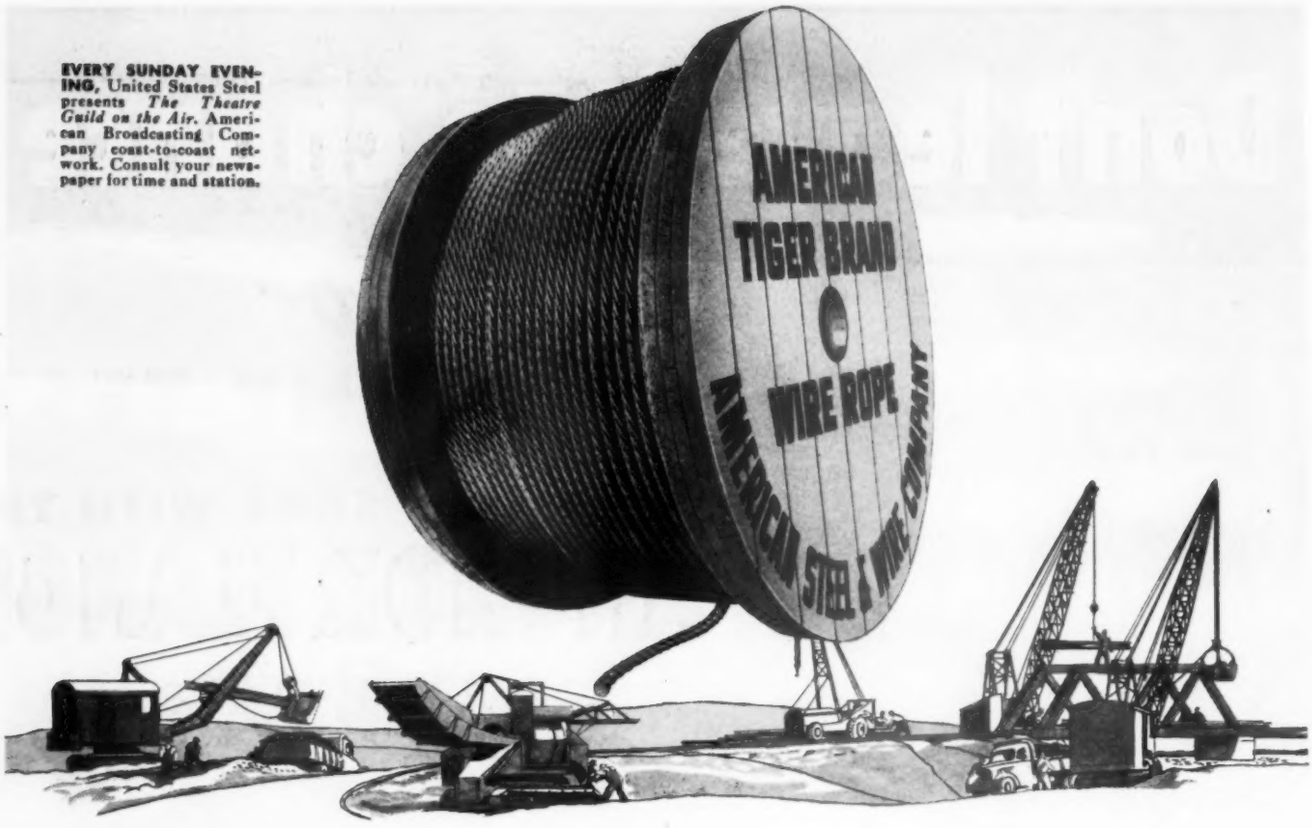
Built into the sturdy leathers by Hy-Test craftsmen, this arc of steel is so much a part of the shoe you never know it's there. It is another indication of how successful Hy-Test has been in providing safety features in trim, neat shoes, workers wear with pride. Drop us a card for details on the Hy-Test servicing plan now available for your plant.

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST *Safety Shoes*

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO.
EASTERN OFFICE • MANCHESTER, N. H.

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.



First— in the Construction field

Made by the world's largest manufacturer of wire rope, U·S·S American TIGER BRAND Excellay Preformed has the stamina to handle the toughest construction job.

This superior wire rope is made of high tensile wire from select U·S·S Steel. It is extra strong, extra tough, extra flexible. And its Excellay Preformed construction means each wire and strand carries its full share of the load.

TIGER BRAND is easy to handle . . . has less tendency to loop or kink . . . can be installed quickly . . . requires shorter breaking-in time. It hugs the sheave grooves and drums . . . has high resistance to bending fatigue and abrasion . . . stands up under long, hard service. It is safe . . . crown wires lie flat and in place when broken . . . jagged wires do not stick out.

You can depend on TIGER BRAND to help reduce maintenance and replacement costs . . . to do a more efficient job in every operation requiring wire rope . . . for back of every reel of TIGER BRAND are the vast research, engineering and production resources of the great mills of United States Steel. You can't buy finer wire rope at any price. So, look up your nearest TIGER BRAND dealer now.

Excellay Preformed

AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York
COLUMBIA STEEL COMPANY, *San Francisco*
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

Preferred by the "Man on the Job"!

OTHER McKAY MILD STEEL ELECTRODES	
McKay Grade	A.W.S. No.
No. 21	E4510
No. 3	E4520
No. 15	E6010
No. 17	E6012
No. 116	E6012
No. 16	E6020
No. 18	E6030
No. 16-H	None
No. 117	None
No. 19	None
No. 10	None
No. 715	E7010
No. 711	E7011
No. 713	None
No. 716	E7020

Because McKAY No. 14 is the *one* electrode which meets most welding rod requirements for maintenance, repair and operating—it has been popularly called the MRO Electrode by the man on the job.

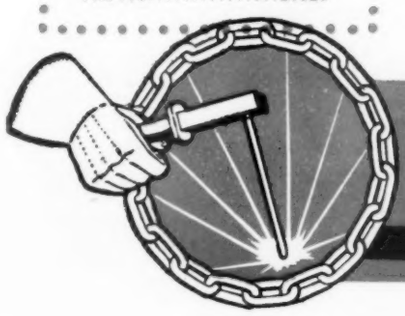
The McKAY No. 14 Electrode is particularly suitable for factory maintenance. It operates with equal ease on either AC or DC machines. Even a relatively inexperienced welder does not have difficulty in getting excellent results.

But whether you require this mild steel electrode or any other of the wide range of mild steel, alloy steel and stainless steel electrodes—specify McKAY by name. The complete uniformity and successful performance of McKAY Rods under all work-uses make McKAY Welding Electrodes preferred by the "man on the job" as well as by the men who engineer the jobs.

Specifications:

McKAY No. 14 Mild Steel Electrode—Made to conform to the standards of American Welding Society's E6013 type of electrode. Made in sizes 1/16", 5/64", 3/32", 1/8", 5/32", 3/16", 7/32", 1/4" and 5/16".

GENERAL SALES OFFICES: YORK, PA.



THE McKAY COMPANY
PITTSBURGH, PA.

WELDING ELECTRODES . . . COMMERCIAL CHAINS . . . TIRE CHAINS

UNISHEARS cut it to fit the job . . . on the job

Courtesy Lockheed Aircraft Company

Bulky, hard-to-handle sheets and forms can be cut to exact shape and perfect fit . . . right where they've got to fit . . . with Stanley UNISHEARS. Does everything bench shears can do but more conveniently, without the mistakes that can happen between bench and job.

Stanley UNISHEARS cut all sheet metals . . . aluminum, stainless steel, magnesium . . . cleanly without burr or distortion. Guide easily on tight curves and small angles either at the edge or inside the material (from a punched hole).

UNISHEARS are made in capacities to handle a range of gauges . . . 18, 16, 14, 12 and 8 gauge. Write for full information on the complete UNISHEAR line. Stanley Electric Tools, New Britain, Connecticut.

STANLEY

TRADE MARK

STANLEY UNISHEARS

Electrically Driven Metal Shears

(*Continued from page* 172)

Conceived by Leighton Wilkie, chairman of The DoALL Company, the model is one of eight types of service and repair shops prepared by industrial planning engineers of the company to assist veterans with mechanical skills who desire to go into business for themselves.

"With big industry unable to maintain employment levels at wartime peak," Wilkie stated today, "the organization of new small enterprises of this kind appears to be the logical answer to employment of the nation's manpower."

Although the various types of shops are designed primarily for repair and service work in any of the thousands of communities scattered from coast to coast, ambitious operators, Wilkie points out, may readily expand into small specialty parts manufacturing, and from this point, they may follow logical expansion into large modern industries producing industrial and consumer goods.

This streamlined machine shop can be housed in the back of a store, a two-car garage, or even in a basement. The equipment includes (1) a contour sawing machine; (2) supply cabinet; (3) drill press; (4) tool cabinet; (5) lathe; (6) arbor press; (7) bench drill press; (8) toolmaker's bench; (9) vise; (10) bench plate; (11) tool grinder; (12) anvil; (13) electric arc welder; (14) oxyacetylene welder; (15) rough bench; (16) vise and (17) storage rack.

A training program is offered at the DoALL Technical Institute which provides the specific layouts for the various shops, lists the machines, tools, and equipment required to begin operation, gives information concerning costs and methods of financing, and, in general, covers the entire prospects of the industry.

A sixty-four page booklet, "Make Money With Your Own Shop", describes the entire program.

* * *

MORE LIGHT ON THE STREET

The problem always before the street-lighting engineer is how to get a larger proportion of light produced by the lamp onto the road. Considering that illumination engineers have been working on this problem for fifty years, an increase of five per cent in efficiency in one year, i. e., from 66 to 71 per cent, represents a sizeable accomplishment.

Such an improvement could be made

(*Continued on page* 178)

For lowest cost–SPECIFY THESE "STANDARDS"

PRICED AS LOW AS 7¢ PER BLANK

Carboloy Standard Blanks include: 5 styles for "universal" use; 3 styles for reamers, scrapers (and centers)—in all the commonly used sizes and grades for machining all metals.

For 60-80% of all your carbide machining needs, you'll find Standard Carboloy Blanks tops in economy—flexibility—convenience. Here's why they rate so high in these important features—

1. *Low Price:* More than 50% of all general purpose Standard Carboloy Blanks range in price from 60 cents down to as little as 7 cents each!

2. *"Universal" Application:* Standard Blanks are designed for broad use throughout your range of machining requirements. With only a small, low-cost inventory in your crib, you're still prepared for quick tool-up on the average job.

3. *Stocked for Prompt Delivery:* Standard Blanks are stocked for quick delivery by Carboloy Company, and authorized distributors in 45 cities, coast to coast. Packaged in standard quantities, for your convenience.

Available in a wide range of sizes; in grades for cutting steel, cast-iron, non-ferrous metals and non-metallics. Write for FREE catalog GT-175R.

CARBOLOY COMPANY, INC.

11191 E. 8 Mile Avenue • Detroit 32, Michigan

CHICAGO • CLEVELAND • HOUSTON • LOS ANGELES • MILWAUKEE • NEWARK • PHILADELPHIA • PITTSBURGH • THOMASTON

Also Sold by Leading Mill Supply Distributors

Standard CARBOLOY (TRADEMARK) CEMENTED CARBIDE *Blanks*

CASTINGS

★ Gray Iron

★ Semi-Steel

★ High Test Semi-Steel

★ Any Size up to one ton

Two modern foundries equipped for fast, efficient production can meet your casting requirements.

THE FOREST CITY FOUNDRIES CO.

2500 West 27th St.
Cleveland 13, Ohio

PHONE PRospect 5040

(*Continued on page* 176)

only by making an entirely fresh start. The new unit designed by Westinghouse lighting engineers is the result of calculation. Based on present knowledge of pavement reflectivities, specularity under wet and dry conditions, a curve of ideal light distribution was prepared. Then by differential equations the reflector shape necessary to provide it was plotted. The shape thus arrived at, quite understandably, came out to be something most unusual. It called for a compact light source, i. e., incandecent horizontal or short-arc mercury-vapor lamp in a reflector shaped as a long, solid oval.

The reflector made as a result of these calculations is extremely effective in directing the available light to the street

A five per cent increase in efficiency has been achieved with this street lighting unit

surface. The enclosing glass lens below, (also shaped to contours determined by mathematics) controls the light that comes directly from the reflector and provides the proper amount of diffusion at every elevation. Even the light that would ordinarily be wasted by the edge where glass and reflector join, is saved by use of auxiliary or booster shields. Translation of the design into a practical unit without sacrifice in efficiency presented problems. For example, it is necessary to make the aluminum reflector in one draw because past experience has shown that a second time through the press results in light-destroying scratches.

Light output curves from data provided by photometric tests on the first of the new units coincided almost exactly with the original calculated curves.

* * *

CARBIDE DIE SERVICE MANUAL BROUGHT OUT BY CARBOLOY

A profusely illustrated 64-page Die Service Manual (Manual D-119) containing complete information on the finishing and servicing of carbide dies for deep drawing and for the production of wire and shaped stock has been made available by Carboloy Company, Inc., of Detroit, Michigan.

In view of the tremendous increase in carbide die usage, the manual has been designed to cover in detail every aspect of carbide die servicing. It should be of major value in reducing die servicing time and costs while assisting users in increasing die life.

The manual is of the composite type, divided into sections according to die size and type. Recommended service equipment and accessories are also listed for each of the individual sections. Each division opens with a quick pictorial summary of the operations required, then goes into a detailed description of the step-by-step operations.

Nomographs for the determination of correct back opening diameters and meeting point diameters and a two-color panel explaining the nomenclature for blank, rough cored, and rough drilled carbide dies increase the practical value of the book to die users.

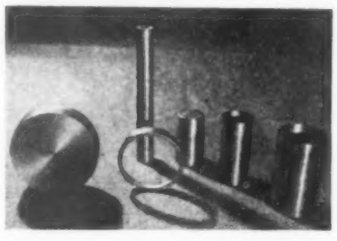
To die users not acquainted with carbide dies, this new Manual represents a gold mine of educational information.

* * *

MOLYBDENUM NOW AVAILABLE FOR MANY USES

Limitations on the production of molybdenum in "chunks" of large size and multiplicity of shapes have been removed by Westinghouse engineers. Furthermore, the cost per pound has been reduced to roughly one third.

Moly melts at 4748 degrees F (iron, 2800; copper, 1976). Thus, although pure moly in powder form can readily be prepared from its natural oxide, it cannot be melted like other metals to form large solid pieces, because any container or crucible of known materials would melt first. Thus, in the past molybdenum pieces have been made by compacting moly powder into the desired shape under great pressure, and then passing a high current through the piece to bring



Molybdenum can now be produced in any size or shape that can be molded, according to Westinghouse engineers.

its temperature up just below the melting point, so that the particles rigidly adhere to each other. This method has obvious limitations, both as to sizes and shapes.

Westinghouse has made advances in a new process that remove the restrictions of both size and shape. The piece can have any desired shape that can be molded. It can be round, square, with fins, or angles, or holes and with much larger overall dimensions than heretofore possible.

The most important characteristics of Moly are its high melting point and great wear resistance at elevated temperatures. Also it has a higher modulus of elasticity, increased strength when hot, and better thermal conductivity than any steel. It is lower than the steels in specific heat and coefficient of expansion. Its corrosion resistance compares favor-

(*Continued on page* 180)

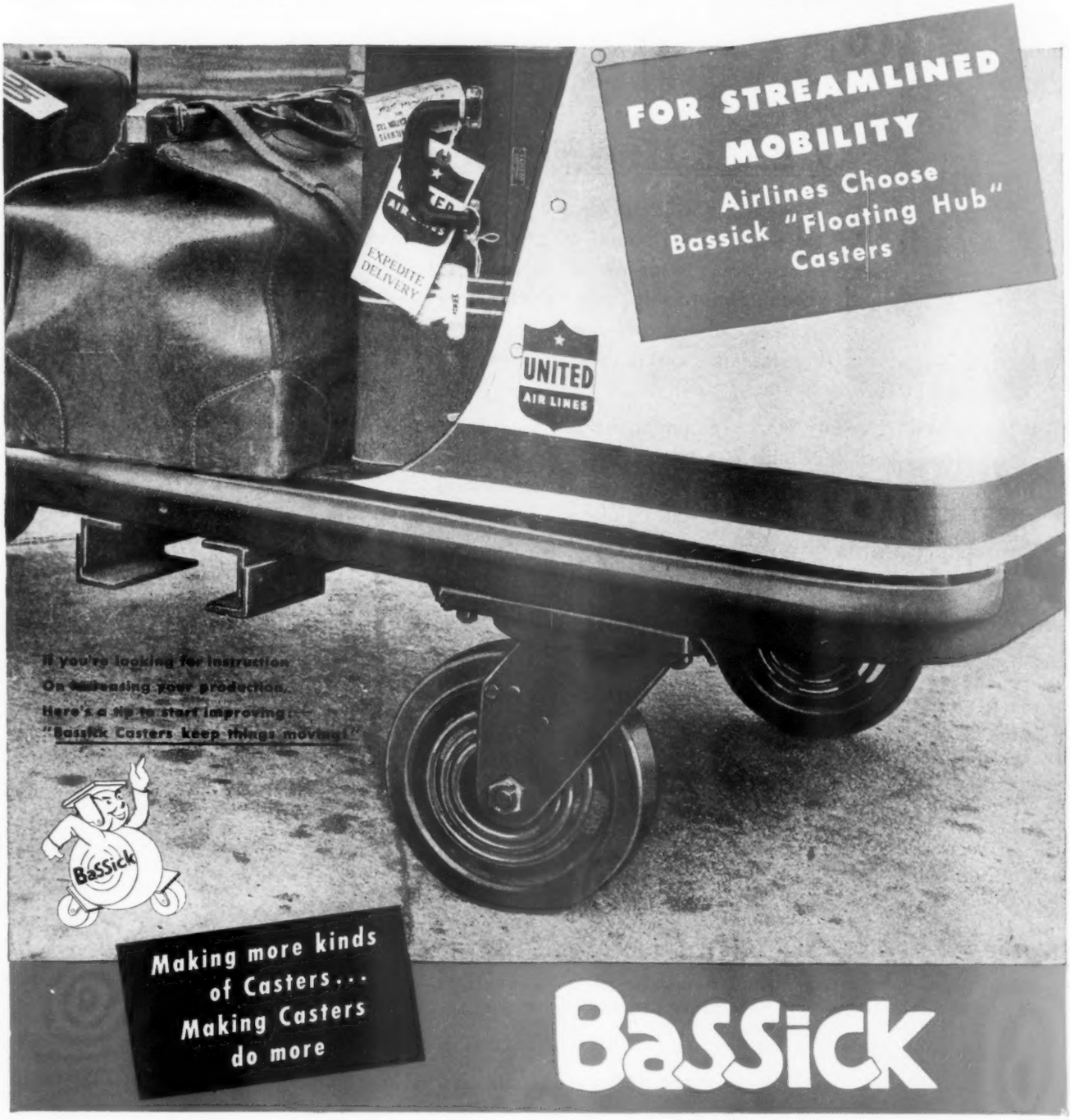
Specialists in fast, smooth transportation, airline officials are quick to see the advantages of Bassick "Floating Hub" Casters and Wheels. That's why United Airlines selected these radically different wheel mountings on airfield service trucks — to eliminate the jolting over uneven ground that might damage material carried, and to give these fast-moving trucks longer life, with smoother, easier operation.

The new "Floating Hub" construction is a notable achievement — a practical solution to a long-sought method of providing springing action between the rim and the axle of a wheel. It literally *floats* the load between rim and axle by building shock absorption in the wheel itself. Besides being effective shock absorbers, "Floating Hubs" keep all wheels on the ground, dampen vibration, reduce noise — give to hitherto unsprung loads the smooth riding qualities of an automobile.

"Floating Hub" Wheels are now being used in hundreds of different applications. Bassick Casters and Wheel Mountings with "Floating Hubs" are available in many sizes for carrying loads ranging from 100 to 2000 lbs. per wheel.

Whenever you need wheels to make things move — from tea tables to the heaviest industrial materials-handling equipment—look to Bassick, the world's largest manufacturer of casters . . . Sold by leading industrial supply distributors.

THE BASSICK COMPANY, Bridgeport 2, Conn. Division of Stewart-Warner Corporation. *Canadian Division:* Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ont.


FOR STREAMLINED MOBILITY
Airlines Choose Bassick "Floating Hub" Casters
EXPEDITE DELIVERY
UNITED AIR LINES
If you're looking for instruction
On increasing your production,
Here's a tip to start improving:—
"Bassick Casters keep things moving!"
BaSSick
Making more kinds of Casters... Making Casters do more
Bassick

Millions of whirling abrasive wheels, trained in war's tough school of precision finishing, each doing a prime job in laboratory, tool room, aboard ship, on production line. And — they're all set and eager to tackle civilian goods now that peace machinery is singing again.

Whether it's removing burrs, smoothing edges, squaring surfaces so accurately that the finish can be measured in micro inches, or cut-off work — there's a Chicago ready to do a top-ranking job for you.

VITRIFIED GRINDING WHEELS with a 50-year pedigree. Up to 3" in diameter in various abrasives and bonds including the famous FV Bond.

MOUNTED WHEELS. The largest assortment made with a shape and abrasive to take care of every internal and external finishing job.

CUT-OFF WHEELS. All types and sizes. Now offered with the sensational new special-formula RT Bond (rubber or resinoid).

SEND FOR TEST WHEEL. Learn first-hand about Chicago's superiority. Tell us what you have to finish, size wheel you'd like and we'll mail one promptly.

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CHICAGO WHEEL & MFG. CO.
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★ Half a century of specialization has established our reputation as the Small Wheel People of the Industry.

PG-2

Send Catalog. Interested in ☐ Grinding Wheels ☐ Mounted Wheels ☐ Cut-off Wheels ☐ Send Test Wheel. Size .....

Name .....

Address .....

(*Continued from page* 178)

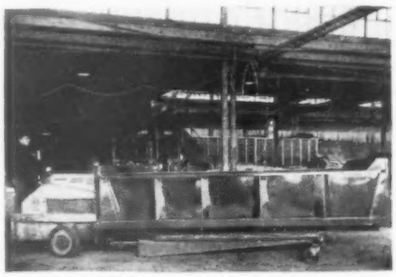
ably in many media with tantalum, palladium, and platinum, each costing many times more than "moly."

Moly is now proving valuable in the form of crucibles, electronic tube parts, electrical contacts, electrodes for resistance heating of glass welding tips, thermocouple tubes, and for electric furnace heating elements for high temperature work in a vacuum or protective atmosphere. It is expected to be useful for welding alloys and high-temperature engine parts.

LONG, HEAVY LOADS TRANSPORTED ON DOLLY BY POWER TRUCK

Long and heavy objects such as the dump-truck body shown in the accompanying illustration may be transported readily by means of a two-wheeled dolly and a low-lift platform truck. The body which is fabricated by welding steel plates, is approximately 15 feet long, 3 feet high, and 6 feet wide. It is lifted onto the dolly by overhead crane.

The dolly is made from steel plate, with the sides shaped and turned down



Dump truck body readily transported

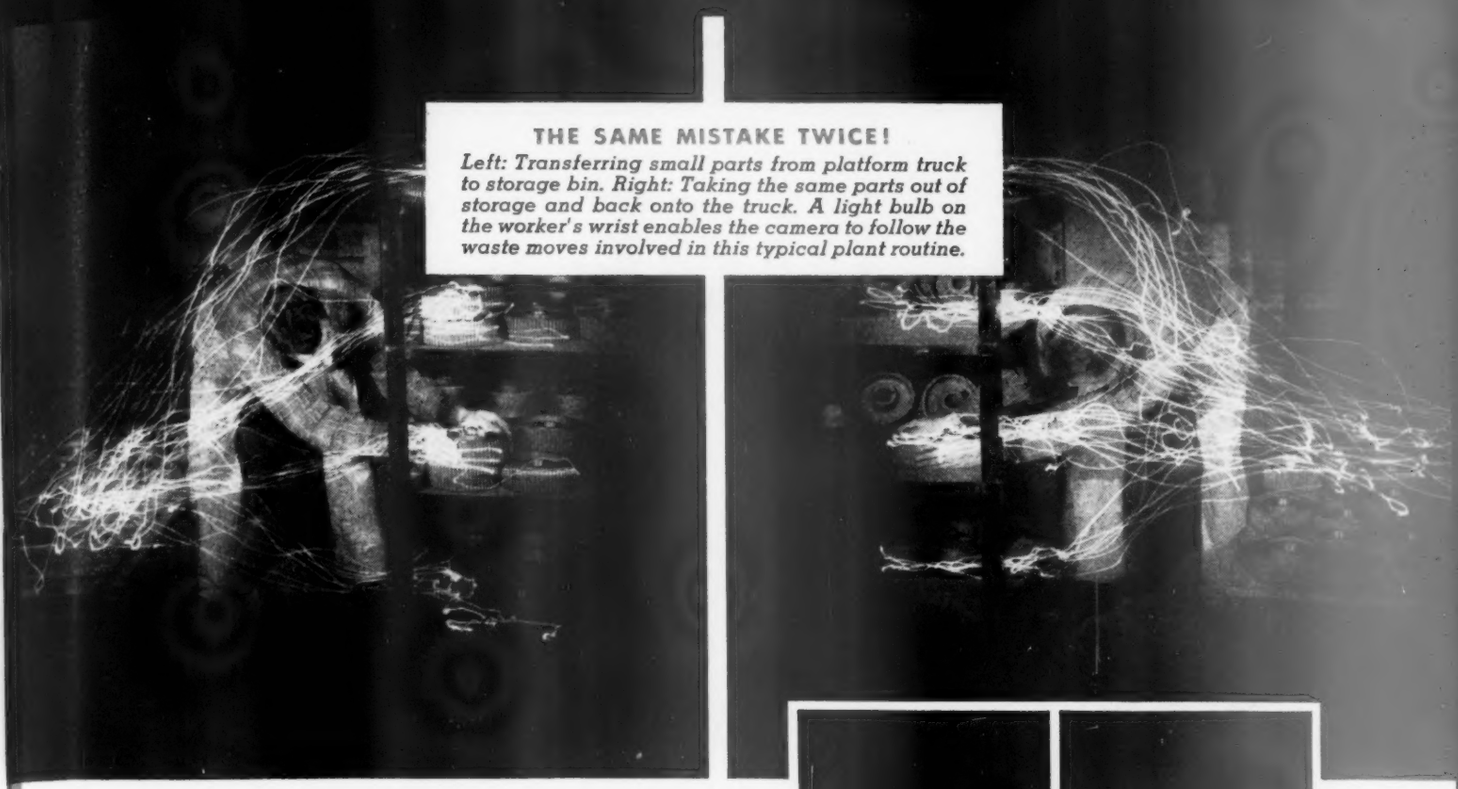
as illustrated. Forward end is mounted on wheels, and the rear end rests on the floor. Upper surface of the dolly is practically at uniform level, at a height making it easy for the truck's platform to be pushed underneath it.

By lifting the rear end of the dolly off the floor the entire load is supported on wheels, four on the industrial truck and two on the dolly. In this position this and similar loads may be moved anywhere in plant, or transported to stockroom or to shipping platform.

NEW LAMINATING PLASTICS

Radically new type of laminating plastic, known as C-5 Resins, is announced by Bakelite Corp., 30 E. 42nd Street, New York, N. Y. The first of these, Resin XJ-17694, is designed specifically as a surfacing material for decorative laminates. This is a xylene-toluene solution with a resin content of 50%. It is rated number 10 on the Gardner color scale; viscosity 15 to 18 centipoises; specific gravity 1.0; flash point of 45 deg. F. Weight per gallon is 8.3 lbs. All colors are available including various grades of white and pastels. Resins im-

(*Continued on page* 182)

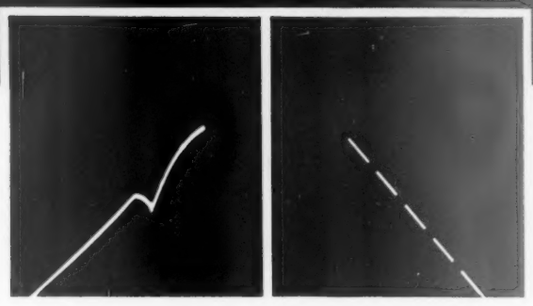


THE SAME MISTAKE TWICE!

Left: Transferring small parts from platform truck to storage bin. Right: Taking the same parts out of storage and back onto the truck. A light bulb on the worker's wrist enables the camera to follow the waste moves involved in this typical plant routine.

DOUBLE TROUBLE

but it's easy to fix!



No doubt about it: Hand storage methods *are* "double trouble" for the plant owner. For, just as this actual camera record shows, there's a big waste of time and effort when materials go *into* storage—and the same waste repeated when they come *out!*

Happily, there's an easy remedy for storage troubles—Barrett Lift-trucks and Skids. Just leave your materials on skids—right through storage—and you eliminate all the loading and unloading, piling and unpiling. When materials are wanted from storage—*zip!*—a sweep of the Lift-truck handle and they are ready to move out!

The Barrett Lift-truck System brings this same efficiency to all parts of your plant. Inside, in moving materials from room to room or floor to floor; outside, in loading and unloading trucks . . . and with such speed and ease that *one man* with a Barrett does more than *3 or 4!* Ask a Barrett engineer where this system can save for *you* . . . no cost or obligation.

IN OR OUT—*ZIP*—LIKE THAT!

With Barrett Lift-trucks and Skids, storage brings no troubles . . . no waste of time and effort. Your materials stay on skids . . . ready to roll the instant you need them . . . with no reloading beforehand!

See the many places better handling can save you money—in your free copy of the Barrett Junior Catalog!

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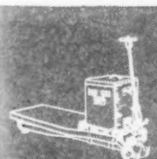
BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

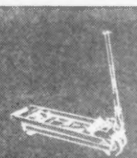
Barrett Handling Equipment

PORTABLE ELEVATORS

STEEL STORAGE RACKS



ELECTRIC LIFT-TRUCKS



HAND LIFT-TRUCKS

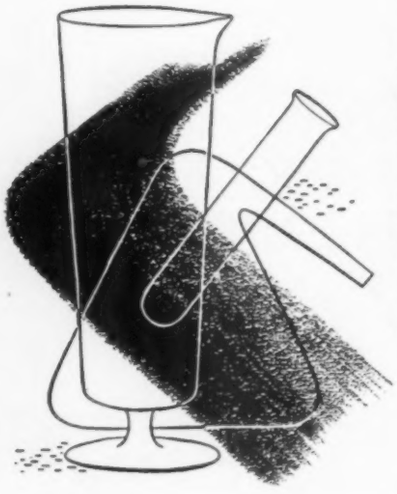
SKIDS

BARREL TRUCKS

NIFTY SYSTEMS

GLYCERINE

...quickly available



Armour's 332 stock points mean fast, dependable service

U. S. P. . . . A chemically-pure, water-white glycerine, meeting all requirements of the U. S. Pharmacopoeia... for use in foods, pharmaceuticals, cosmetics or any purpose demanding highest quality. Specific gravity, 1.249–25° C./25° C.

HIGH GRAVITY . . . A pale yellow industrial glycerine. Specific gravity, 1.262–15.5° C./15.5° C.

DYNAMITE... Made especially for the explosives trade. Specific gravity, 1.262–15.5° C./15.5° C.

ARMOUR AND COMPANY

1355 W. 31st Street, Chicago 9, Illinois

Vital Links in modern Production

ALLIED MACHINE & ENGINEERING CORP.

NEW PHILADELPHIA, OHIO

(*Continued from page* 180)

part extremely high gloss and lustrous surface. C-5 Resin surfaces provide hard continuous film, yet retain such good flexibility that the laminated structure may be postformed within limits. Surfaces are highly scratch-proof and scar resistant; are highly resistant to organic solvents, soap solutions, citric and other fruit acids and boiling water; stain resistance is excellent. Technical bulletin "Bakelite C-5 Laminating Resins— XJ 17694" is available upon request.

MATERIALS HANDLING DATA FILE

Compact "Towmotor Data File" designed for users and prospective users of lift trucks and lift truck accessories, has been published by the Towmotor Corp., 1226 East 152nd St., Cleveland 10, Ohio.

In addition to describing the company's line of lift trucks and accessories and their uses, one section provides case studies of saving time, money, manpower and storage space. There is also a "Lift Truck Operator's Guide", and a "Materials Handling Analysis Guide".

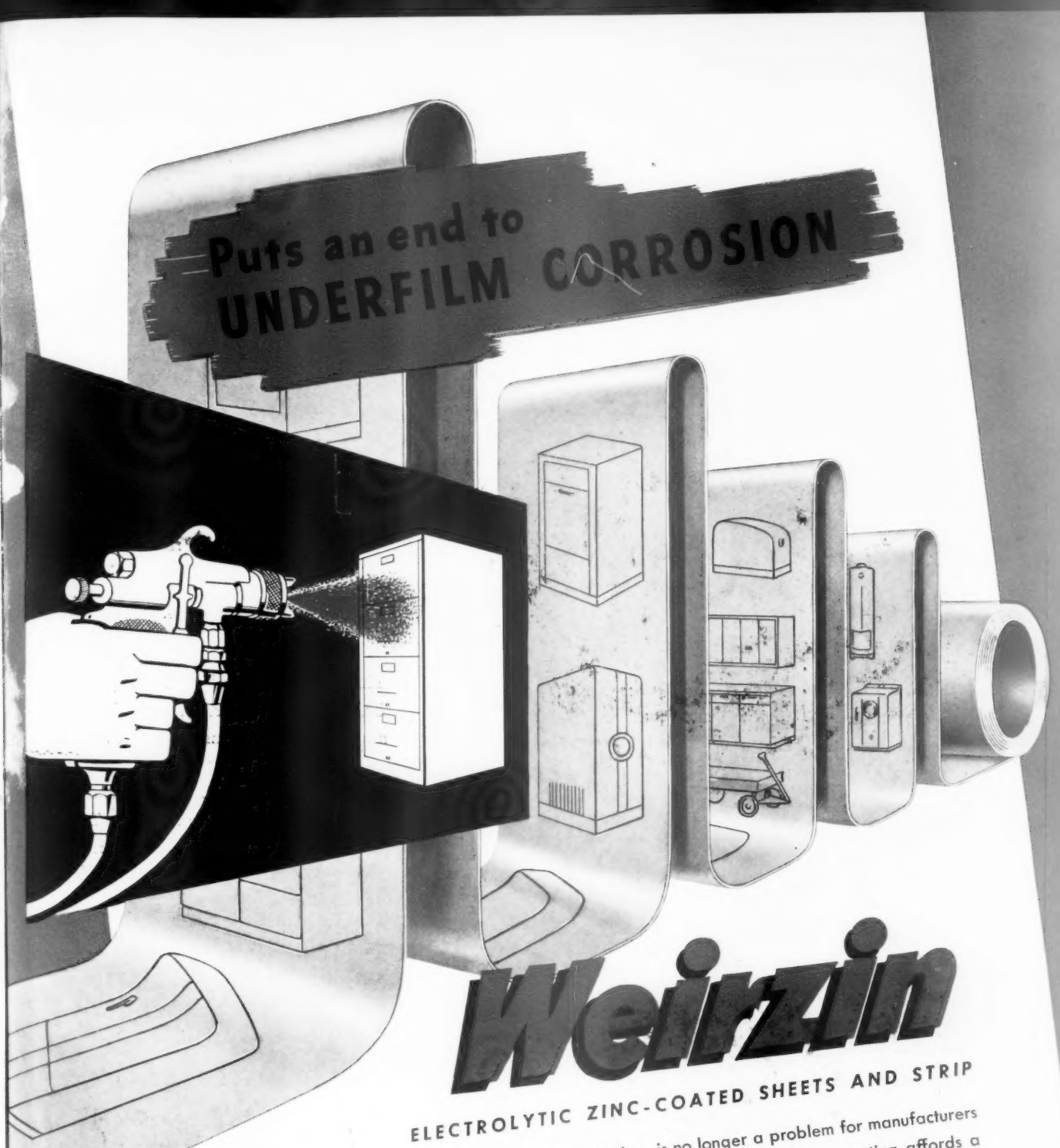
NEW ELECTRONIC CONTROL FOR OXYACETYLENE CUTTING

A new "electric eye" tracing device for pantograph type oxyacetylene cutting machines that radically simplifies steel cutting operations and for the first time makes intricate design cutting practical—considerably expanding the present application of torch cutting machines in industry—has been announced by Air Reduction, 60 East 42nd Street, New York 17, N. Y. The new device, applied to machine gas cutting in collaboration with General Electric Company, will be known as the "Electronic Bloodhound." It completely eliminates expensive metal and wood templates and all other mechanical or manual auxiliary guiding devices.

Electronically controlled tracing equipment cuts the most complicated shapes with great precision from quickly prepared outline drawings or silhouettes of the desired piece. There are no limitations to the variety of designs which may be cut as the electronic tracing head faithfully follows the most complex angles and curves with extreme accuracy.

A new field of application has been opened in machine production cutting through the "chain" method of reproduction made possible with this type of tem-

(*Continued on page* 186)



Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Under-film corrosion, enemy of lasting surface finishes, is no longer a problem for manufacturers who use Weirzin sheet or strip for their products. The tight, malleable zinc coating affords a perfect "tooth" for spray, dip or roller applications—safeguards permanently against rust or corrosion beneath the surface finish.

Weirzin's double-protection factor—better "tooth" plus corrosion-resistance—is applied to every inch of surface area. Its uniform coating will not flake, peel or powder under extreme forming stresses . . . remains intact under all conditions of temperature and humidity.

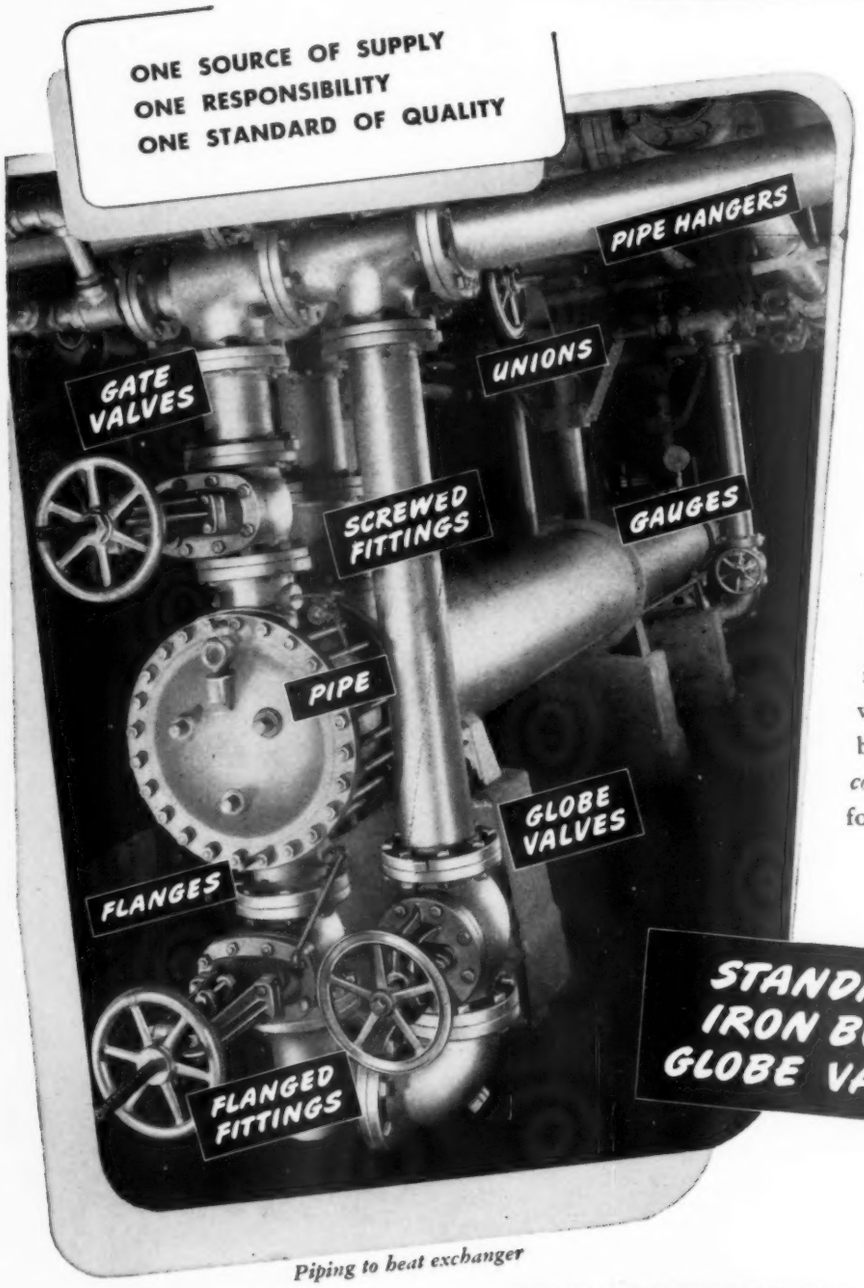
Put Weirzin in your production picture, and bring a better product to postwar markets at a substantial saving in manufacturing costs. Elimination of pickling, cleaning and buffing operations, prime coats and inventory loss makes Weirzin the most economical material you can use.

WEIRTON STEEL CO.

WEIRTON, W. VA. Sales Offices in Principal Cities

Division of **NATIONAL STEEL CORPORATION** Executive Offices, Pittsburgh, Pa.

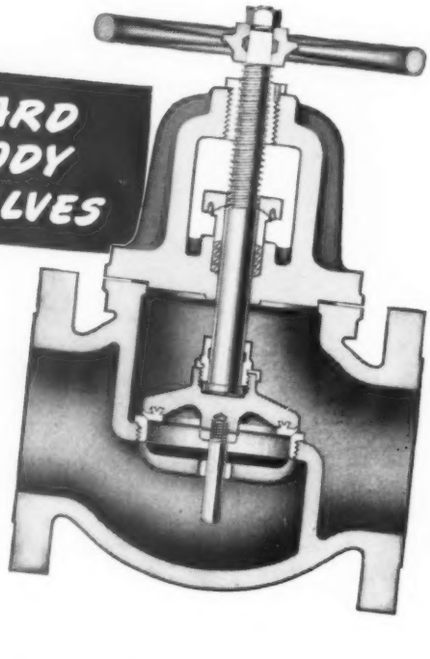
For "User's Choice" of Piping Materials ...it's the Complete CRANE Line



Piping to heat exchanger

Piping systems operate under varying conditions. What conditions should dictate your choice of piping materials, you can best determine. Then Crane helps you meet those specific requirements with the world's largest line of valves, fittings, pipe and piping accessories for all applications. By demonstrating the merits of all types of materials, Crane, with 90 years' experience, enables you to choose correctly for every need.

Ordering from the Crane line simplifies all piping jobs. Your Crane branch or Wholesaler supplies all materials. You're sure to get a better installation and better performance with all parts of uniform quality, backed by single responsibility. This *complete* Crane service is *made-to-order* for your peacetime program.



SERVICE RECOMMENDATIONS:

Crane Standard Iron Body Globe and Angle Valves meet all general service requirements with working pressures up to 125 pounds steam. Brass-trimmed valves are recommended for steam, water, and fluids non-corrosive to brass or iron; all-iron valves for fluids that corrode brass but not iron. Also available with choice of composition discs for steam, hot water, cold water, air, oil, and other services. In sizes from 2 in. up—with screwed or flanged ends. Crane also makes iron body globe and angle valves in all-iron; with brass trim; and with composition disc; in sizes from ¼ to 2 in. Rated at 150 pounds steam, 250 pounds cold. See your Crane catalog, pages 143 to 151.

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. • *Branches and Wholesalers Serving All Industrial Areas*

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

Sure-fire relief for plant "*trip*" grief!

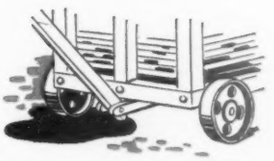
SAFETY-SURFACE. Careycrete's texture provides a smooth yet non-slip, non-skid traffic surface.

NATIONWIDE DISTRIBUTION—Warehouse stocks of Careycrete provide prompt service regardless of job location.

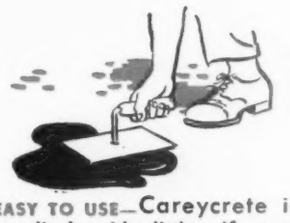
Careycrete smooths out accident-inviting holes and breaks in factory floors—fast and for good. It's easy on worker's feet . . . quiets traffic noise . . . outlasts concrete.

Careycrete is an ideal safety-surface for old floors or new. It won't crack or chip. Many of the country's largest industries use it.

Carey will resurface your floors or instruct your own maintenance men on how to do it. Consult your nearest Carey Branch for information or write—



STANDS HEAVY TRUCKING—Specially processed asphalt, reinforced with mineral fibres, makes a tough "traffic-safe" surface.



EASY TO USE—Careycrete is applied with little, if any, interference with plant routine.

THE PHILIP CAREY MANUFACTURING CO.
LOCKLAND, CINCINNATI 15, OHIO

Carey

IN CANADA: THE PHILIP CAREY CO., LTD.
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Careyduct • Industrial Insulations • Rock Wool Insulation • Asbestos Shingles and Siding • Asphalt Shingles and Roofings
Built-up Roofing • Roof Coatings and Cements • Waterproofing Materials • Asphalt Tile Flooring • Pipeline Felt
Expansion Joint • Asbestos Wallboard and Sheathing • Corrugated Asbestos Roofing and Siding • Miami-Carey Bathroom Cabinets and Accessories

at your finger-tips!

With JOMAC Industrial Work-Gloves, you've got flexibility right down to your finger-tips! What's more, you've got safety . . . no matter how tough the job!

There's a reason for JOMAC's superiority. Its extraordinary fabric is "loop-finished," with hundreds of "air-cell" cushions *lock-stitched* into place. JOMAC Industrial Work-Gloves are *made* for *longer* wear . . . they give up to 7 *times* the wear of ordinary work-gloves!

When you look for flexibility, safety *and* long life in a work-glove, look to JOMAC, the work-glove that makes friends with workers and production men alike! For details, write C. Walker Jones Co., 6135 North Lambert Street, Philadelphia 38, Pa.

"SHAKE HANDS WITH SAFETY"

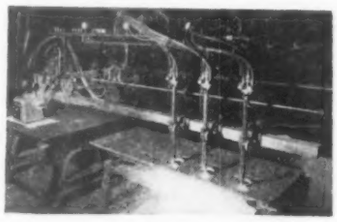
JOMAC INDUSTRIAL GLOVES

Try JOMAC'S "Pencil-Pick-up Test"! You'll NOTE the difference!

(*Continued from page* 182)

plate. In this chain method, a series of identical shapes are drawn on the template and connected with a continuous line, making production cutting of several pieces possible in a single operation.

Shape cutting is no longer limited to the ability of the tracing device to follow template contour and sharp corners may be cut without subsequent machining or



"Electric bloodhound" on oxygraph cutting machine.

the use of elaborate jigs. Shapes are now cut directly from a drawing with exacting precision—whether the order calls for 1 or 1000 pieces. Human error and previous mechanical restriction have been eliminated.

Templates required for electronically controlled cutting are simple outline drawing or silhouetts—a black outline about ⅛" wide against a white background or

Angles, contours and corners are followed with great accuracy.

any other color combination which provides sufficient light contrast. These drawings may be treated with a protective coating for long life.

Electronic Tracing Equipment consists of two units—the tracing head and control box. All working parts are fully protected and the electronic tubes designed for long life. This equipment is easily attached to any Oxygraph or Travograph cutting machine in place of conventional equipment.

VERTICAL "HORIZONTAL" BROACHING MACHINES

One of the most unusual lines of "post-war" broaching machines yet to make its appearance has just been announced by Colonial Broach Company, Detroit 13, Michigan. Designated as Colonial "Flat-top" Utility pull-down broaching machines, the best short description of them probably is that they are vertical "horizontal" machines.

Since the early days of broaching the horizontal type of broaching machine has been considered the all-purpose or "Universal" type. Such machines usually had fairly large vertical platens at one end for mounting the work while the

(*Continued on page* 188)

BUSY?

● Tearing your hair over delays and piled-up orders? Then you need a time-saving ordering shortcut—a quicker, simpler, better way to order lamp bulbs. Whether it's a single special lamp or thousands of brighter, longer-lasting G-E Fluorescent lamps for general plant or office lighting—here's the answer—and it works!

SPECIFY G-E LAMPS

● No matter if it's a filament lamp, or a fluorescent, germicidal or an infrared lamp—General Electric makes it. This complete line means *one call* fills all your lamp requirements. And too, your G-E Lamp supplier can furnish useful lighting information and engineering help on special jobs—*plus* prompt, efficient delivery of G-E Lamps.

Save time. Simplify your lamp orders. Call your G-E Lamp Salesman NOW and see how you can cut buying time from hours to minutes using one salesman, one order for G-E Lamps. Start using this complete G-E Lamp service TODAY.

Tough lighting problem? Turn to General Electric. Contact your nearby G-E Lamp Office . . . or write General Electric Lamp Department, Division 166-P2, Nela Park, Cleveland 12, Ohio.

G·E LAMPS

GENERAL ELECTRIC

Research is Always at Work to Improve G-E Lamps and Make Them STAY BRIGHTER LONGER!

LEA Shows the Way

THE PIECES . . .

cast aluminum plates

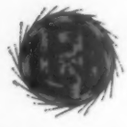
THE PLACE . . .

Pacific Gear Plant
Western Gear Works
Vernon, California

HERE'S another factory where LEA Finishing Specialists helped to work out proper finishing methods . . .
. . . and where LEA is supplying the proper grades of LEA COMPOUND, industry's greaseless composition for burring, polishing and other finishing operations.

Yes, the proper finishing of metals and non-metals calls for a thorough knowledge of the behavior of materials during the various finishing operations. It calls for the broadest experience in finishing . . . in burring, in polishing, in buffing.

There's where LEA fits into the picture. We're glad to have your orders for LEA COMPOUND and LEAROK, the "no-free-grease" composition for buffing. But why not suggest to your production department that they have a LEA Specialist check over their present finishing methods?



THE LEA MANUFACTURING CO.
WATERBURY 86 ,CONN.

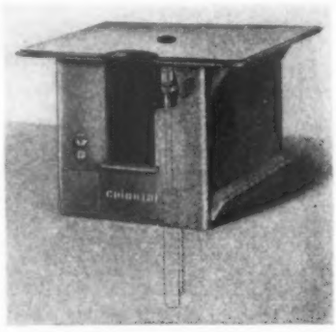
Burring, Buffing and Polishing . . . Manufacturers and Specialists in the Development of Production Methods and Compositions

2-LM-3

(*Continued from page* 186)

broach was pulled through. It was necessary usually of course to provide some means of supporting the work in some manner during broaching—particularly if the work piece was large.

The new "Flat-top" machines obviate this. By making the platen horizontal, large bulky parts can be slid onto the table and manually positioned without any other support. Thus setting up for the broaching of one or several holes in the same bulky part, broaching of keyways in such parts, etc., becomes a simple matter.



"Utility" machine for large work

The machine according to Colonial is not intended for high production broaching, although automatic broach pullers are available. Primary purpose of the machine is to fill the need for a "Utility" machine for large work which will eliminate the necessity of special work holding fixtures. In the "Flat-top", the broach is pulled through the work by an hydraulic pull-mechanism operating on the same principle as in Colonial Universal Horizontal machines. Machine illustrated is of 4-ton capacity with 30" stroke; requires floor space 42 x 65"; table measures 24 x 60" and its flat surface is 48" above the floor.

EXPECT TO PRODUCE EIGHTY MILLION TIRES IN 1946

The rubber industry is expected to produce goods in 1946 with a value of $1,500,000,000, an increase of 66 per cent over the corresponding figure of $900,000,000 in 1939, the last wholly peacetime production year, according to Herbert E. Smith, president, U. S. Rubber Company.

Major part of this record production will be accounted for by tires. Operating at capacity, the industry is expected to produce more than 80,000,000 units, of which 66,000,000 will be passenger car tires. Previous largest passenger car tire output was 50,000,000, in 1941. Achievement of the 66,000,000 goal of 1946, which is at the rate of more than two tires a second, will ease the tire shortage, but not noticeably until the latter half of the year.

Other goods, such as footwear, golf balls, "Lastex," and drug sundries, will also be scarce in the early part of the

(*Continued on page* 190)

FACTS about THREAD MILLING CUTTERS

Multiple thread milling cutters are usually made as wide as the portion to be threaded. This permits threading to be completed in one revolution of the work. When sharp "V" threads are to be milled, "staggered tooth" cutters are recommended.

For all types of thread milling cutters, you are assured accurate work at minimum cost when you specify NATIONAL tools—the National choice.

Call Your
DISTRIBUTOR!

Leading distributors in every section of the country have stocks of National Cutting Tools. Every National distributor offers factory trained engineers to serve you. Call your National distributor for cutting tools or any staple industrial product.

NATIONAL
NATIONAL TWIST DRILL & TOOL CO. ROCHESTER, MICH. U.S.A.

TWIST DRILLS
REAMERS, HOBS
MILLING CUTTERS
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SPECIAL TOOLS
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Here's A Practical Way to Test Manganese Steel Chain . . .

Austenitic manganese steel chain has an initial cost a little higher than ordinary chain, *but in the severest service it has given twice to ten times the service life*, which makes it highly economical in the long run. It is impossible to realize the difference in performance until you have actually used chain made of "the toughest steel known."

A convenient and practical way to ascertain whether manganese steel chain will save you money is to inspect the elevator and conveyor chain in your plant. Where you find weak links which will soon need replacement, order Amsco manganese steel links to replace them. Amsco chain

C-120. No. 830 conveyor chain with F-25 attachments made for an automobile manufacturer.

A-190. Ten strands of Amsco No. 847 pintle type chain with K-2 attachments every other link for a California cement mill.

and attachments are available in most standard types and sizes, all interchangeable with ordinary chain.

By comparing the life of the manganese steel links with those you have been using, you can accurately determine which are lowest in ultimate cost. This experiment is well worth while, as it has pointed the way to substantial reductions in chain costs in steel plants, mines, cement, lumber and pulp mills, quarries and in general industry.

One reason for the superior performance of Amsco chain is found in the properties of austenitic manganese steel. Presenting a test-bar tensile strength of 125,000 lbs. p.s.i. (average test) and a developed-in-service surface hardness up to 550 Brinell, combined with a ductile, shock-resistant body metal, Amsco chains withstand for long periods abuse that quickly destroys chains of ordinary metals.

Send for Bulletin 742-CN, "Amsco Manganese Steel Chain for Elevating and Conveying."

How Amsco-Nagle Centrifugal Pumps Resist Abrasion and Corrosion is detailed in Bulletin 940.

AMSCO

Foundries at

Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; Oakland, Calif.; Los Angeles, Calif.; St. Louis, Mo.

Offices In Principal Cities

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS • ILLINOIS

AMERICAN Brake Shoe COMPANY

(*Continued from page* 188)

year, but with the industry geared for capacity output, supplies will greatly increase as the year progresses.

Total consumption of rubber by the United States in 1946 is estimated at 900,000 tons, which compares with the previous high of 780,000 tons in 1941, and an average of 540,000 tons in pre-war years. Of the 900,000 tons, approximately one-third may be natural rubber and the remainder various kinds of synthetic rubbers.

World consumption of all types of rubber for 1946 is placed at 1,400,000 tons. The year's potential world production of all such rubbers is estimated at 1,900,000 tons, of which 1,200,000 is synthetic capacity in the United States.

FOUR TIMES THE TONNAGE WITH HALF THE MANPOWER

Adopting a modern mechanical handling system has enabled the Apex Transportation Company of Philadelphia, Pennsylvania, to increase the daily tonnage handled by their crews some 100 tons per day, an increase of 400% over the tonnage handled when loading and unloading was done with manual labor. In addition, the use of Towmotor lift trucks has enabled Apex to do this additional work with a crew only half as large as was previously employed.

Handling two casks of wine at one time.

Handling imported commodities on the Philadelphia waterfront, the Apex Company is called upon to move a wide variety of products, and the flexibility of lift trucks has proved an important factor in this work. Among products handled are casks of wine, huge, heavy casks that required the combined efforts of three men when each cask was handled manually. Two casks are handled on each trip, with only one man required to perform the task. Other products, handled efficiently by the lift truck method at the Apex docks are barrels of olives, crated automobiles weighing as much as 6,000 pounds, motors, machinery and bags of almonds.

Because of the confined areas in which the lift trucks must operate, the maneuverability of the trucks has been a decided advantage. An example of the extra work that this modern handling system has performed for Apex is shown in the increase of trucks unloaded per day. With manual methods, only four trucks were "worked" daily.

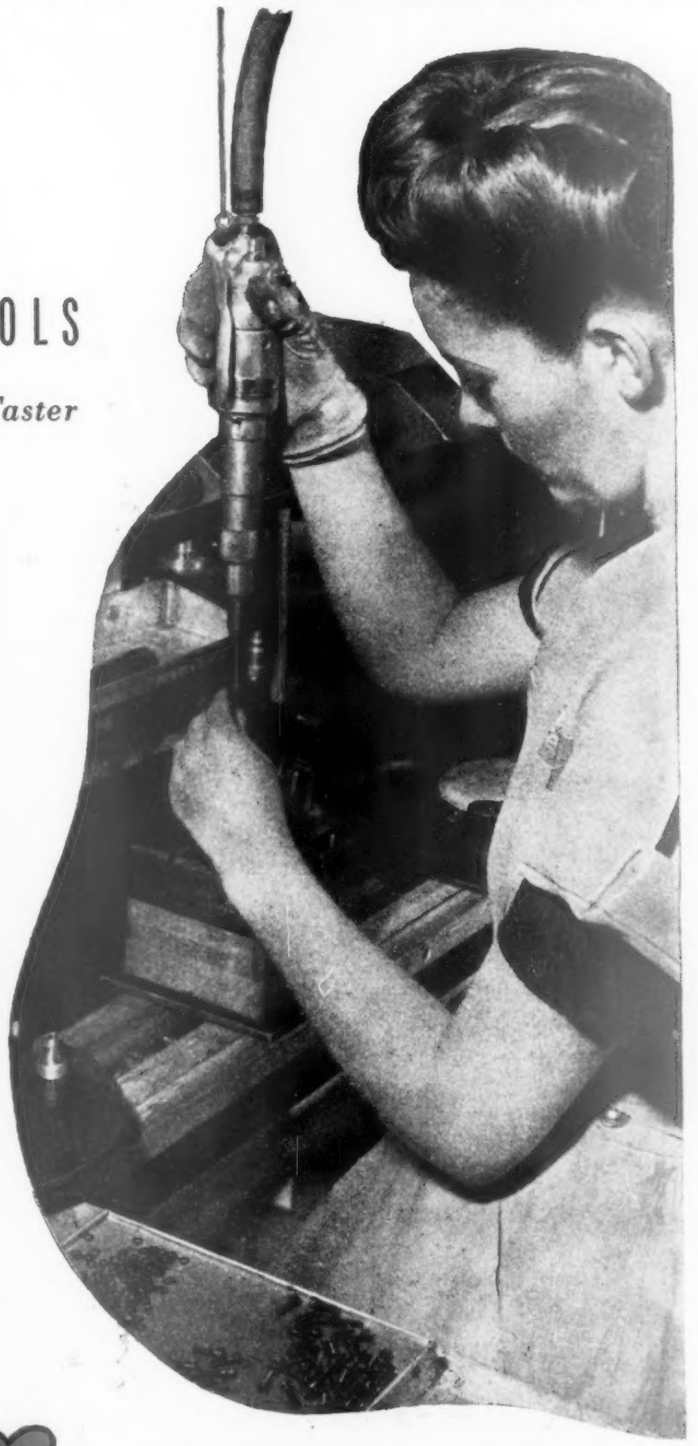
(*Continued on page* 194)

There are Six HIDDEN HANDS *in this Picture*

Thor

PNEUMATIC ASSEMBLY TOOLS

Drive Screws, Set Nuts, Three Times Faster Than Hand Tools



The *picture* shows this girl's two hands operating a Thor 217 Pneumatic Screwdriver.

But, if you could *watch the job* you would see in the speed with which this girl completes assemblies a ratio of "six hidden hands" inside that Thor tool which help her assemble *faster . . . surer* than any three operators using hand tools.

NO HUMAN HAND can approach the unfailing accuracy, precision and speed with which Thor pneumatic assembly tools drive screws and nuts. On most models, an *adjustable* clutch, invented and perfected by Thor, controls precisely the tightening of the fastener to the exact tension required. No guesswork, no "feeling your way"—each screw or nut is *right* every time.

And you get *safe speed*—for, while Thor screw and nut drivers are amazingly fast and powerful, automatic governors and precision gears adapt torque and speed to the tool application at hand.

If you have assemblies you want to speed up with Thor's "six hidden hands" don't hesitate—write or call your nearest Thor branch today.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois

BIRMINGHAM BOSTON BUFFALO CLEVELAND DETROIT LOS ANGELES
MILWAUKEE NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS SALT LAKE CITY
SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

Here's enough gas to last your home for 200 years.

If you burn manufactured gas for cooking and water heating, your home uses about 72,000 cubic feet of gas a year, on a national average. This one gas holder contains more than 15,000,000 cubic feet of gas. There are gas holders which hold as much as 20,000,000 cubic feet.

When gas is manufactured, the process of producing it must go on more or less steadily throughout the 24 hours. But the rate of consumption varies widely. The gas holder is the device that "takes up the slack."

Since 1878, the Bartlett Hayward Division of Koppers has built more gas storage holders in the United States than all other builders combined.

The holder pictured here, which helps to serve Brooklyn, is an example of the waterless type which was introduced by Bartlett Hayward in 1924 and has been extensively used since then. It has resulted in an improved appearance in gas holders, and lowered operating and maintenance costs.

The Bartlett Hayward Division of Koppers also manufactures a special form of bronze called D-H-S which provides valuable new properties; it makes Fast's Self-aligning Couplings, which are important in many power transmission operations; it produces ships propellers; it has introduced the Aeromatic Variable-pitch Propellers which give automatic control for personal aircraft; and it manufactures a great many devices and systems for the production and distribution of gas.

Bartlett Hayward Division, Koppers Company, Inc., *Baltimore, Md.*

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

THE TRUMBULL ELEC. MFG. CO.
MADE IN U.S.A.
TROLLEY CLOSUR
125 A.
250 V
PAT. No. 2117480

Designers & Manufacturers
PRODUCTION TOOL CO.
Tools-Dies-Jigs-Fixtures-Gauges
610 Sevier Ave., Knoxville 7, Tenn.

PALM BROTHERS
decals give

Made by
Stevens-Arnold Co.
ELECTRICAL EQUIPMENT
SOUTH BOSTON, MASS., U.S.A.

UNITED AIRCRAFT PRODUCTS, INC.
DAYTON, OHIO
U.S. of AMERICA

HEINEMANN
CAT. NO.
PROTECTING
HEINEMANN ELEC. CO.
TRENTON, N.J.
EQUIPMENT PROTECTOR

Palm Brothers Decals are ideal for your identification and instruction data requirements, and may be serially numbered. These famous Decals make a handsome appearance and can be used on any commercial surface.

See for yourself! Samples submitted without obligation. Write today for Catalog No. 10.

EYE-APPEAL
PERMANENCY
ECONOMY

THE PALM BROTHERS Decalcomania Co.
CINCINNATI..12...OHIO..U.S.A.

What type of STAINLESS FASTENER do you need?

Prompt delivery from the largest stock in the nation!

Screws . . . nuts . . . washers . . . pins . . . Allmetal carries the largest stock in the country of stainless steel fasteners and screw machine parts. We also have facilities for heading, tapping, drilling, reaming, slotting, turning, stamping, broaching and centerless grinding . . . and we work not only with stainless and monel, but also with duralumin, aluminum, brass, bronze, or any other non-corrosive metal. All parts produced to close tolerances. Write for our catalog today. Allmetal Screw Products Co., 33 Greene St., New York.

Send for FREE CATALOG

This new, 83-page catalog helps you select the correct size and type of non-corrosive fastening device for any particular job. Includes stock sizes, specials that can be made, engineering data, etc. Make request on company letterhead.

ALLMETAL SCREW PRODUCTS CO.
33 Greene Street, New York 13

SPECIALISTS in STAINLESS FASTENERS

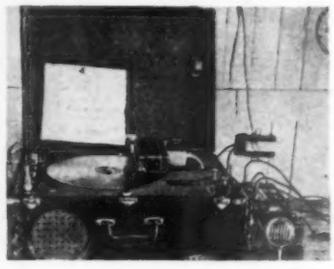
LOUISIANA PIPE LINE INSTALLS TWO-WAY RADIOTELEPHONE

Because the area was almost entirely swampy, and one location was totally inaccessible except over water, the Union Sulphur Company, Inc., of Sulphur, Louisiana, has installed a complete Galvin Manufacturing Corporation two-way radiotelephone communications systems in connection with the operationg of a 100-mile pipe line, which it maintains for the Reconstruction Finance Corporation, Office of Defense Plants.

The installation consists of one 250-watt FM transmitter-receiver operating at the main office, Sulphur Mines, Louisiana, with a 250-foot tower; twelve portable 50-watt FM units and five mobile 50-watt FM sets for the cars and trucks. The system operates on 33,620 KC.

The mobile units are operated by personnel who have supervision of maintenance, gas dispatching, communications and drilling of oil. Used in place of regular telephone, since there is none, the radiotelephone has proved thoroughly dependable as the sole means of direct communication.

In some of the locations, the power is furnished by a public electric utility, and



Automatic recording device makes record of everything transmitted over entire system.

in other places, remote from power lines, gasoline-driven generators provide the primary power.

Permission was granted by the F.C.C. for the company to start operation with a single radio operator who holds the required licenses. And the government agency also allowed the company to keep the necessary station logs by means of an automatic recorder device, which is located at the Main Station. It is believed that this is the first time that a recorded log has been maintained, eliminating troublesome filling out of forms, records, etc.

An average of over 200 calls have been placed over this system daily.

WELD-SPATTER-RESISTANT COMPOUNDS

Two new weld-spatter-resistant compounds, No. 9951 and No. 9952 have been announced by the Electric Welding Division of the General Electric Company. Both of the new compounds are specially formulated for use in the welding field wherever weld spatter is undesirable and must be avoided easily and economically.

Furnished in powder form, ready to be mixed with water, the compounds are identical in performance. The only difference between them is that the No. 9951 is nonadherent and can be readily removed with an air hose or a dry cloth, while the No. 9952 is semi-adherent but can be quickly and easily removed with a damp cloth or a direct stream of water.

A feature of these compounds is that the surface of the work, even if slightly

oily, does not require wetting before they can be applied. Another feature is that a special ingredient in the compounds eliminates the necessity of a water-soluble binder in order to obtain adhesion. Therefore, since the compounds are inert and cannot burn, they are completely smokeless.

The compounds are easily mixed and applied. Water is added slowly until a thin paste is obtained. No lumping occurs, and the mixture can be applied with an ordinary bristle brush. The brush can be safely left in the compounds afterwards or readily cleaned with cold water.

One gallon of either will adequately cover 450 to 750 square feet of work, depending upon the thickness with which the compound is applied.

SILICONE OILS FLOW AT 121 DEGREES BELOW ZERO

Silicone oils that flow at temperatures as low as 121 degrees below zero Fahrenheit, without congealing, have been developed by General Electric's Research Laboratory in Schenectady, it was announced by Dr. Eugene G. Rochow of the G-E Research Laboratory, speaking before the Rochester section of the American Chemical Society.

These oils, prepared with methyl silicone polymers, will be useful as hydraulic fluids for aircraft systems in the operation of flaps, doors, and landing wheels, according to Dr. Rochow. Silicone oils also be used in fine instruments, in watches and clocks, and as a dielectric fluid in capacitors and transformers, he said.

"The silicone oils, developed by G-E chemists, have flow points as low as minus 121 F and may be used at plus 302 F without oxidation or sludging, their most unusual property being their small change of viscosity with temperature," Dr. Rochow declared.

He explained that methyl silicone polymers, in the form of elastomers, produce a silicone rubber that does not decompose at plus 400 F nor harden at minus 67 F, and maintains its elasticity over long pe-

(*Continued on page* 196)

Over the years, concentrated attention to uniformly high quality chemicals has helped to build for Dow its deep-rooted reputation for reliability and service. Important among the Dow materials produced under this strict code are the industrial chemicals listed below.

DOW INDUSTRIAL CHEMICALS

Acetanilid, Technical
Acetylene Tetrabromide
Aniline Oil
Anthranilic Acid, Sublimed and Technical
Bis Phenol-A
Bromacetic Acid
Bromine, Purified
Bromoform, Technical
4-tert-Butyl Catechol
Calcium Chloride, Anhydrous, Flake, Liquid, Powder and Solid
Carbon Bisulphide
Carbon Tetrachloride
Caustic Soda, Flake, Liquid and Solid
Chloracetyl Chloride
Dichloracetic Acid
Dichlordiethyl Ether
Diethanolamine
Diethylaniline
Diethylene Glycol
Diphenyl
Diphenyl Oxide
Dipropylene Glycol
Dowtherm A
Epsom Salt, U.S.P. and Technical
Ethyl Benzene
Ethyl Chloride
Ethylene Chlorbromide
Ethylene Dibromide
Ethylene Dichloride
Ethylene Glycol
Ethylene Oxide
Ethyl Monobromacetate
Ethyl Monochloracetate
Ferric Chloride, Crystals and Solution
Ferrous Chloride, Dihydrate
Hexachlorethane
Hydrobromic Acid
Isopropyl Formate
Magnesium Chloride, Anhydrous, Flake and Powder
Methocel (Dow Methyl Cellulose)
Methyl Bromide
Methyl Cyclohexane
Methyl Monobromacetate
Methyl Monochloracetate
Mining Salts
Monobrombenzene
Monochloracetic Acid
Monochlorbenzene
Monoethanolamine
Orthochlorphenol
Orthocresotinic Acid
Orthodichlorbenzene
Orthophenylphenol
Parachlor Orthonitraniline
Parachlorphenol
Paradibrombenzene
Paraphenylphenol
Para Tertiary Butyl Phenol
Perchlorethylene
Phenol
Phenol Sulfonic Acid
Phenyl Acetate
Phenyl Hydrazine
Phenyl-
Phthalimide
Propylene Dichloride
Propylene Glycol
Propylene Oxide
Sodium Sulphide
Styrene
Sulphur Chloride, Yellow
Sulphur Monochloride
Tetrachlorethane, Ind. Grade
Trichlorbenzene
1, 1, 2-Trichlorethane
Triethanolamine
Triethylene Glycol
Triphenyl Phosphate
Triproplylene Glycol

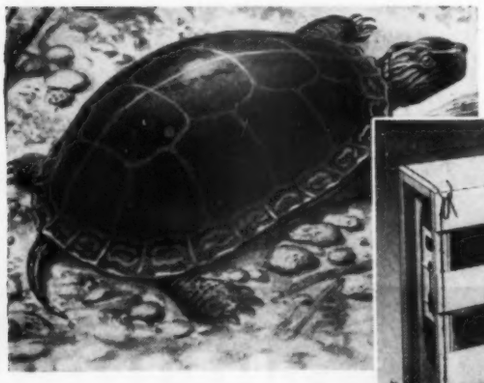
THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle

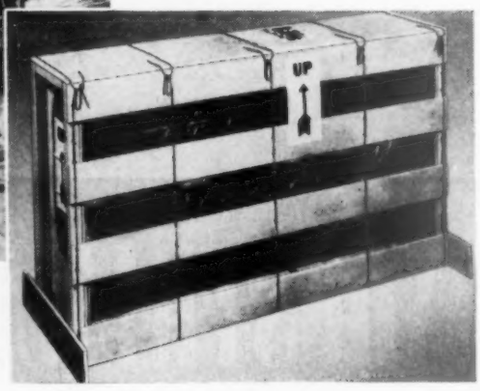
DOW

CHEMICALS INDISPENSABLE

THE CONTAINER IS "PART OF THE PRODUCT"



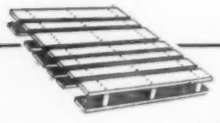
. . . NATURALLY



GENERALLY. . . .

NEW
"GENERALIFT" PALLETS

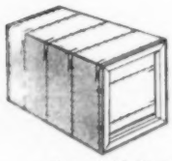
Millions of pallets were used by the armed forces. They saved from 50% to 90% in materials handling. We are now in full production of pallets for all industry. Our engineers will design a pallet best suited to your specific needs. Write today for Pallet Book.



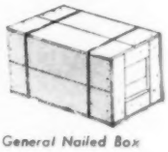
"Generalift" Pallet

General Corrugated Box

Write today for your free copy of booklet on GENERAL'S *"Part of the Product" Plan.*

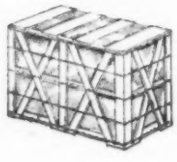


General All-Bound Box



General Nailed Box

General Cleated Corrugated Container



General Wirebound Crate

Turn to the Turtle for another good example of real "Part of the Product" protection. GENERAL Engineered Shipping Containers are also designed specially for the product. There are many advantages that are important to you . . . and to the profit side of your production picture.

They're compact—no space is wasted. More GENERAL boxes to the load or box car. They're light, yet extra strong—no weight is wasted. GENERAL containers are easier to handle, more economical to ship. They're quickly and easily assembled.

Further, frequently the GENERAL Engineered Shipping Container and the product come down the conveyor line together—as a unit. Result: increased production, reduced man-hour costs.

We will be glad to help you too with your packing problems. Write today for more information.

ENGINEERED SHIPPING CONTAINERS

General BOX COMPANY

GENERAL OFFICES: 48 W. Illinois St., Chicago 10, Ill.

DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon.

Continental Box Company, Inc.: Houston, Dallas.

(Continued from page 194)

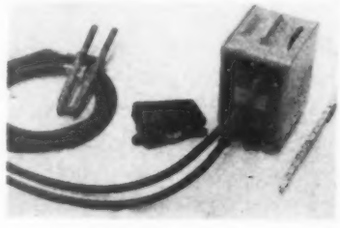
riods of time at the high temperature of 302 F under load.

Mentioning other silicone products, Dr. Rochow asserted that G-E scientists have found some methyl silicone resins which undergo no decomposition or disintegration over a period of years at 392 F and maintain their dielectric strength for long periods even at 572 degrees Fahrenheit.

"Stability at high temperatures is no longer considered to be the only virtue of the organosilicon polymers, however," the G-E scientist explained. "Silicone oils and rubber may well prove to be valuable because of their performance at low temperatures, lower than those at which organic oils and elastomers are satisfactory."

LIGHTWEIGHT PORTABLE BRAZING SET

Brazing is an old but still not too generally used method of joining members of copper, brass, bronze, or various alloys. One handicap has been the lack of brazing apparatus that can be readily taken to the job, as in shipyards, railroad shops, etc. For the production lines of factories, the well-developed brazing furnaces are in much demand, but there has



This portable brazing set requires only connection to a 220-volt power source.

been a need for portable units for joining wire cables, strap connectors, pipe, etc. This need has been met by Westinghouse engineers with a self-contained family of brazing sets that require only a connection to a 220-volt power source. These sets consist essentially of a transformer for providing high currents at low voltage, suitable voltage selectors, controls, and carbon-tipped tongs that can be clamped over the pieces to be joined. The high currents flowing through the carbons bring them to incandescence, quickly raising the material to brazing temperatures, which are from 1200 to 1500 degrees F.

Three sizes, 5, 10, and 20 kva, comprise this group of mobile brazing elements. The 5- and the 10-kva units are air-cooled. The 20-kva unit is fan-cooled and has a self contained water cooling and recirculating system used to cool the brazing cables and tongs. This cooling system permits the use of a small-size portable unit for medium brazing work. The smallest unit weighs about 30 pounds, the middle-size one 100 pounds, and the 20 kva, 250 pounds. The corresponding secondary currents are 625, 833, and 1667 amperes.

(Continued on page 201)

PHILADELPHIA RECORD

SUNDAY, JUNE 28, 1942

TEN CENTS

8 SPIES LANDED BY U-BOATS SEIZED

Vow to Divert From Russia

MATERIALS FOR SABOTAGE ALSO FOUND

Plant Here Among Targets; Men Carried $149,748 U.S. Cash; Had Map of New York Water Supply.

NEW YORK, June 27 (U.P.)—The Federal Bureau of Investigation tonight announced the capture of eight saboteurs landed in the United States from German submarines.

troops in Action

Nazi

AMONG the points marked for destruction by these Nazi spies was the $3,000,000 plant of the Pennsylvania Salt Manufacturing Company on the banks of the Delaware River at Cornwells Heights, Bucks County, Pa., in which Cryolite, imported from Greenland, is processed for American industry.

Our enemies regarded this mineral as one of our most important products, and their estimate of its value was quite correct. Cryolite *is* vital to us in war and peace. It is now available to American industry under its commercial name of Kryolith.

Kryolith

REG. U.S. PAT. OFF.

NATURAL GREENLAND CRYOLITE

IS BENEFITING THE CERAMIC INDUSTRY TODAY by its long fluxing action, high degree of opacity and quicker reduction of batch, due to its low melting point.

IS AIDING IN GLASS MANUFACTURE through its capacity to dissolve coloring oxides, thereby improving lustre and clarity.

IS GIVING TO ENAMEL MANUFACTURERS greater freedom from chipping and crazing, and purer whiteness through its low melting point and lasting fluxing action.

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

1000 WIDENER BUILDING, PHILADELPHIA 7, PA.

New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma

Again
PREPARED TO SERVE YOUR EVERY
ELECTRICAL WIRE AND CABLE
NEED...
GENERAL CABLE
ROLL THIS WAY
GUARDIAN
BUILDING WIRE

WHICH OF THESE PRODUCTS DO YOU USE?

Cut Out and File for Future Reference

ASBESTOS WIRES AND CABLES

BARE AND TINNED COPPER WIRE
Solid and Stranded, Copper Covered Steel Wire, Trolley Wires, Segments and shapes.

BUILDING WIRES
Rubber, Braid and Lead, and Synthetics, all types.

CONTROL CABLES
Rubber, Braid, Lead, Steel, Armored and Non-metallic Railway Signal Cable, Fire Alarm Cable, Switchboard Cable.

CORD SETS

FIXTURE WIRE

FLEXIBLE CORDS
All Types.

HEAVY DUTY PORTABLE POWER & CONTROL CABLES
Welding Cables, Mining Machine Cables, Dredge Cable.

MAGNET WIRE
Round, Square and Rectangular, Enameled, Paper, Cotton, Silk, Glass, Asbestos Covered, and Combinations.

NON-METALLIC SHEATHED (ROMEX)

PAPER POWER CABLES
Belted or Shielded, Gas Filled Cables, Oil Filled Cables.

RADIO WIRES AND MICROPHONE & HIGH FREQUENCY CABLES

RUBBER POWER CABLES
Braid, Lead, Steel Armored, and Non-metallic.

SERVICE ENTRANCE, SERVICE DROP CABLE

TELEPHONE WIRES AND CABLES
Rubber Insulated, Paper Insulated.

VARNISHED CAMBRIC WIRES AND CABLES

WEATHERPROOF WIRE
Slow Burning.

X-RAY CABLE

and . . . Electrical Wires & Cables to your specifications

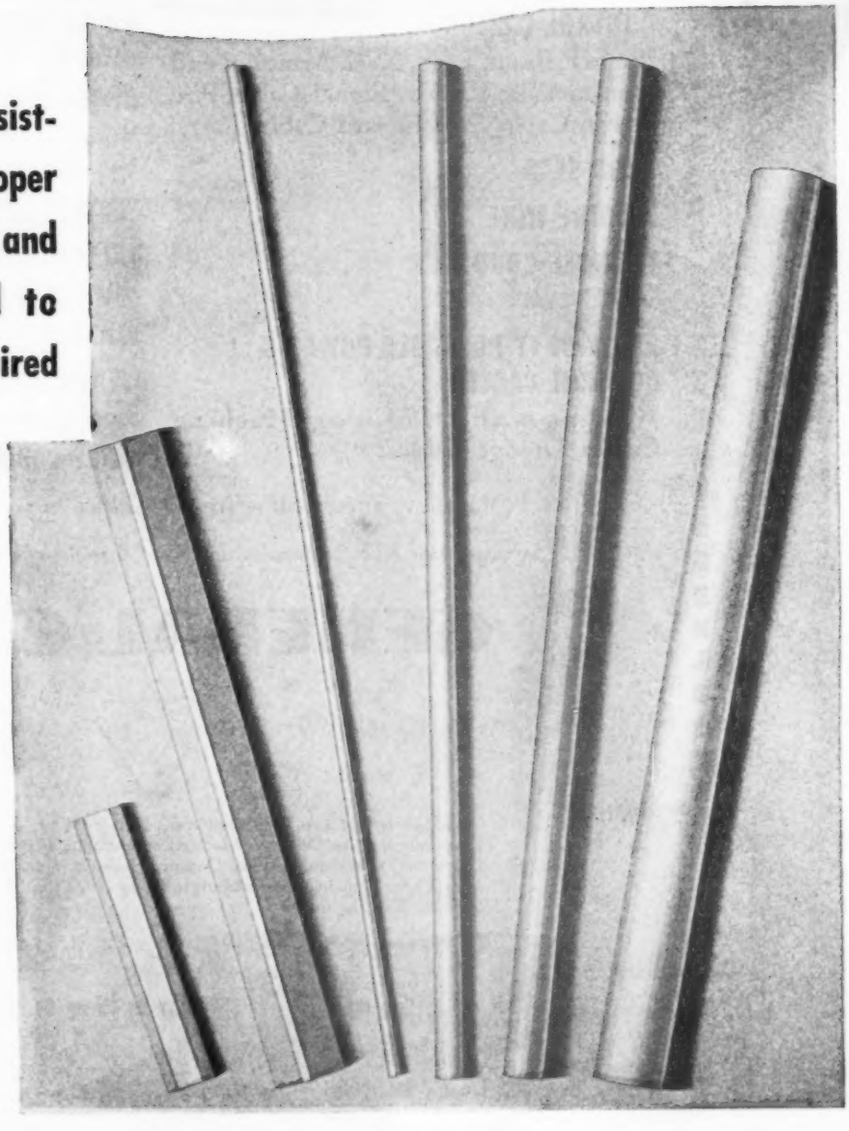
See your phone book for complete address of our sales office in the cities listed below.

GENERAL CABLE
CORPORATION

Headquarters at 420 Lexington Ave., New York 17, N.Y. General Cable Corporation Sales Offices are located at: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Kansas City, Los Angeles, New York, Philadelphia, Pittsburgh, Rome, N. Y., St. Louis, San Francisco, Seattle, Washington, D. C.

AGALOY TUBING

Corrosion and heat resisting Agaloy tubing — proper surface condition INSIDE and OUTSIDE — processed to form and bend as required



Accurate, cold drawn AGALOY tubing manufactured in *seamless* and cold drawn *welded* is available in the following metals:

- **STAINLESS—304, 321, 347, 410, 430, 446 and other types**
- **MONEL metal**
- **INCONEL**
- **NICKEL**
- **L NICKEL**

Sizes 5/8-inch O.D. and smaller.

For all *small tubing* requirements AGALOY manufactures cold drawn low carbon, high carbon and alloys in sizes up to and including 5/8-inch O. D. *Write for catalog.*

AGALOY TUBING COMPANY • 75 WEST STREET, NEW YORK 6, N. Y.

***Chicago Office:* 221 North La Salle Street, Chicago 1, Illinois • *Mill:* Springfield, Ohio**

DUMPING UNIT ADAPTED FOR USE WITH FORK LIFT TRUCKS

The Phillips Phil-Dump Junior, material handling unit developed by the Phillips Mine and Mill Supply Company of Pittsburgh, Pa., is now adapted for use with fork lift trucks.

The Junior Phil-Dump has a one-half cubic yard capacity with an overall length of 66", width 24½", height 38¼". It is equipped with solid rubber tires for ease of operation and floor protection.

It is a practical unit for transporting and unloading scrap, castings, stampings, cuttings, sand, fertilizer, and powdered chemicals. It can be used with all standard type fork lift trucks, also as a hand push model.

Further information may be secured by writing direct to Phillips Mine and Mill Supply Company, Jane Street, Pittsburgh 3, Penna.

* * *

NEW PLASTIC'S GLOW IS VISIBLE 6 TO 8 HOURS

A new series of plastics from which can be fashioned street markers or door numbers that glow visibly six to eight hours after exposure to sunlight or other illumination, is announced by Monsanto Chemical Company, St. Louis, Mo.

Identified as polystyrene materials of "the 1200 Lustron series," they have an after-glow potency more than double that of any prewar phosphorescent thermoplastic, and are the outgrowth of extensive wartime research undertaken in the company's Plastic Division Laboratories at Springfield, Mass.

Because they remain visible through most of the hours of darkness, rather than fading out after two or three hours, as did their prewar forerunners, the new compounds are considered likely to find widespread industrial and home applications.

Such ordinarily-elusive objects as wall switches, light cords, drawer pulls, door knobs and telephone dials are among the possibilities, while still others include clock faces, instrument dials and auto dash boards.

Subject to the same supply restrictions as applied to other thermoplastic molding materials, the Lustron series are available in phosphorescent colors of green, green-blue, blue and bright blue. Daylight colors range from green to gray, but may be made in a still broader range.

Now . . . 6 Demonstration Rooms Pioneered for Your Use

- BOSTON
- CHICAGO
- CLEVELAND
- DETROIT
- ST. LOUIS
- TROY

Others to follow.

You are invited to try out *right on your own products* the newest Coated Abrasive methods and machines for faster, better grinding and finishing. In these well-equipped rooms you will find, among others, the following machines:

Backstands with abrasive belts running over resilient contact wheels which prove your old set-up wheels completely uneconomical.

Wet-belt grinders equipped with waterproof abrasive belts; no warping or discoloration.

Swing-Frame belt grinders that so staunchly handled the really big jobs of war production.

High-speed portable tools that mount abrasive gadgets—slotted discs, Spirapoints, Spirabands, etc., for recesses hard to reach.

Tiny belt machines for many a finishing and deburring operation; very versatile and economical.

Portable disc-grinders for welds, rough edges, metal clean-up, and other tough jobs.

All these, plus fine conference rooms where you can sit around a big table, examine and discuss the latest abrasive specialties and talk over your grinding and finishing problems with our Product Engineers. Make an appointment soon with our nearest Branch.

BEHR-MANNING · TROY, N. Y.
(DIVISION OF NORTON COMPANY)
RELIABLE COATED ABRASIVES SINCE 1872

New

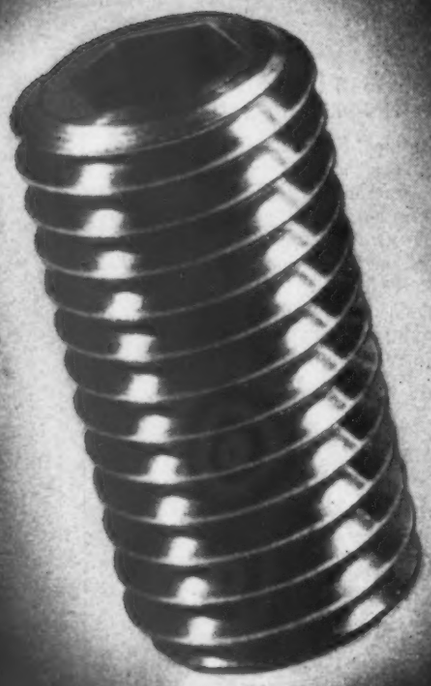
PARKER-KALON

★ Ground Thread

SOCKET SET SCREWS

Parker-Kalon – cooperating with Landis Tool Co. – has adapted centerless thread grinding – the process once employed only for producing screws used in the finest precision equipment – to quantity production of P-K Set Screws.

Made from hardened stock, with the characteristic smoothness and distinctive bright appearance of a ground finish, these new screws are as different from ordinary set screws as night and day!



P-K puts something really New in

New

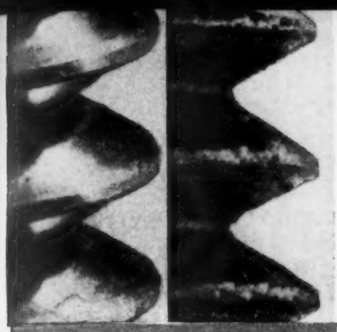
PARKER-KALON

★ Size-Marked ★ Gear Grip ★

SOCKET HEAD CAP SCREWS

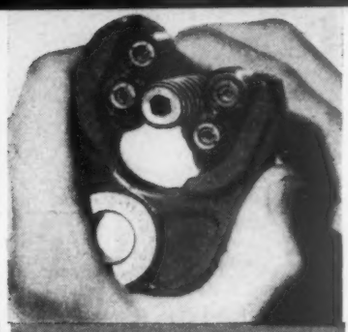
Another Parker-Kalon "first", the Size-Mark is an exclusive feature sure to be welcomed and appreciated by every socket screw user. The correct size of each screw can be seen at a glance. Together with the Gear Grip, which prevents slipping and fumbling, the Size-Mark gives P-K Socket Head Cap Screws a double feature that will save you hours of time and trouble.

★U. S. Patent No. 126,409



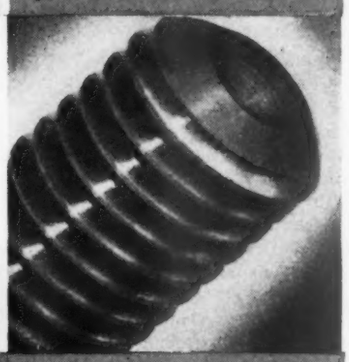
SMOOTH, CLEAN THREADS Compare the gleaming ground threads (left) with tool-marred surfaces of cut threads (right).

FAULTLESS THREAD CONTOUR AND LEAD Ground thread smoothness and accuracy are apparent in the comparator.



DEPENDABLE CLASS 3 FIT The new centerless thread grinding method assures remarkable uniformity.

CLEAN STARTING THREAD Permits P-K Ground Thread Set Screws to start easier, and speed assemblies.



in SOCKET SCREWS

ONE QUICK GLANCE tells the size. No need to "mike" or gauge it! No chance for costly errors!

EVEN EXPERIENCED MEN need the Size-Mark. Tests show many guess wrong 50% of the time.

NO TIME WASTED and no wasted screws when screw sizes get mixed up, if they are Size-marked!

GEAR GRIP enables fingers to get a firm grip even when slippery with oil – makes driving surer, safer.

By adapting centerless *thread grinding* for P-K Socket Set Screws, and by adding the *Size-Mark* and *Gear Grip* to P-K Socket Head Cap Screws, Parker-Kalon gives industry the first really NEW developments in socket screws in years.

Each of these improvements offers welcome and worthwhile advantages to socket screw users . . . faster and better assemblies, improved security, elimination of errors, and time-saving in the tool-room and on the assembly line.

Parker-Kalon Socket Screws have always been held to the highest standards of accuracy, strength, and appearance by a Quality-Control routine unsurpassed in the industry. Now, Thread Grinding, the Size-Mark, and Gear Grip put them years ahead in every test of utility and performance.

GIVE YOUR NEW PRODUCTS, and your present products, the advantages of these new features. SAMPLES will be sent at your request. See them – compare them . . . and you'll agree P-K Socket Screws are the logical choice for your assemblies.

LIMITED RANGE OF SIZES NOW AVAILABLE

Present facilities permit the manufacture of only a few sizes on a quantity production basis. As soon as additional equipment is put into operation, other sizes will become available. Meanwhile, write for samples. Parker-Kalon Corp., 202-204 Varick St., New York 14.

☆ Ground Thread
☆ Size-Marked
☆ Gear Grip

AVAILABLE ONLY IN

PARKER-KALON
Cold-forged
SOCKET SCREWS

SEE THEM AT THE PARKER-KALON BOOTH

NATIONAL METAL EXPOSITION

CLEVELAND . . . FEBRUARY 4-8

Among the ASSOCIATIONS

PROGRESSIVE EDUCATION

Abstract of Discussion before Metropolitan Purchasers Assistants Club, New York.

By GEORGE E. HENRY

EDUCATION is one of the key activities of the National Association of Purchasing Agents. Many of the local associations have educational committees and some are sponsoring educational courses in purchasing for the benefit of members and their staffs.

Basically, education is a process of training in a school or instruction to fit one for a calling or vocation by systematic instruction. At the present time some 70 major colleges, universities and business schools have courses on industrial purchasing.

In the higher schools of learning, however, such courses are not exclusively dedicated to the purpose of fitting persons for the vocation of purchasing. You will find that they are made a part of the curriculum on industrial management or business administration. The curriculum includes the basic factors of procurement such as economics, business fundamentals, market analysis, accounting, commercial law, and the details of purchasing procedure from departmental organization on through specifications, supply sources, efficient buying, inventory control and so on.

Purpose Is Two-Fold

The purpose of these courses is two-fold: First, to provide a practical background for persons who contemplate making a career of purchasing; and, second, to provide men who are gearing themselves for major managerial and administrative positions in industry, with a clear concept of the importance of industrial purchasing, its fundamentals, its potentialties, and its place in management. True, it is a long range program, but it is a vital one, and over the course of the years it is playing an important role in building an understanding of the highly specialized activities that combine to create the post of purchasing agent.

It is paying excellent dividends for the reason that it is implanting in the minds of men destined for the top administrative jobs, a well defined understanding of the problems and benefits of efficient procurement, and the responsibilities of the Purchasing Agent, as well as the indispensability of policies that will concentrate full and complete authority for any and all procurement in his hands, to which we might add, materials control.

The purpose is to inculcate in future executives the fact that the function of procurement is not merely one of copying, signing, and sending out orders; that in big business there are numerous factors involved some of which impinge upon the nation's very economic fibre, that call for intimate study and analysis of materials and markets as well as sources of supply in a systematic manner that is beyond the ken or opportunity of department and executive heads who already have definite responsibilities, who could not very well carry on in their primary functions were they required to devote time to the numerous elements that make for successful procurement.

A Job to be Done

One thing that should ever be borne in mind is that the fact of the indispensability of centralized purchasing as an implement of successful plant or industrial operation, is not yet accepted by many persons in major as well as minor authority, in spite of the fact that some 15,000 major industrial and manufacturing operations have such departments.

There are many who do not understand that modern industrial procurement is a phase of managerial cooperation between understanding men looking to the welfare of their company. Much of this misunderstanding I believe is based on false pride, and like many of our atavisms is a mere carry-over from the old era, the era when many plant men who had a specific job to perform, also had the pleasure of being the big shot that the salesman must talk to, accompanied by the inner glory of having the authority to give an order to some one for something.

The truth is that it is a responsibility they do not know how to shoulder. Many of them do not know the involvements of building up a dependable list of dependable competitive suppliers. Like Lady Godiva, they gamble everything they have on one horse.

I venture that many big companies are losing money hand-over-fist for the simple reason that they have not vested full and complete authority in their Purchasing Departments, and because many men permitted to specify and to buy do not understand the fundamentals of efficient procurement.

On the other hand, if men in purchasing are to have unrestricted authority, they must prove and demonstrate that they have the "Know How" and the

(*Continued on page 208*)

URGE CAUTION ON ESCALATOR CLAUSES — WASHINGTON

Sparked by forum leadership of Ed Scully, Director of Purchases for the Engineering & Research Corp., Riverdale, Md., and past president of the Eighth District of the National Association, in a lively discussion of the essential facts of escalator and similar clauses in procurement contracts, the Purchasing Agents Association of Washington, D.C. got off to a good start in the new year at their January 8th meeting at the Mayflower Hotel.

That escalator clauses are of great concern to the purchasing profession there can be no doubt, as for almost two hours members of the local group discussed all aspects of the subject. As a result of the discussion, it was the concensus that purchasing should present a united and solid front against capricious and unwarranted attempts of sellers to include escalator clauses in bids and contracts. While recognizing that certain legitimate price advances during the life of a contract may be in order when substantiated by positive evidence of government action, it was the opinion that purchasing agents should proceed very cautiously in the acceptance of escalator clauses and should insist upon opportunity of approval by the buyer of any price advance prior to date of shipment, or the exaction of a suitable escalator clause.

The association also passed a motion to present to the National Association, through the Council Meeting of the Eighth district, a recommendation that the N.A.P.A. urge the Congress to extend the life of the OPA after June 30, 1946 and, to urge that Congress take early action in the matter.

Announcement was made that National Night would be held on March 12, 1946, at the Mayflower Hotel, at which time, the guest speaker will be Charles L. Sheldon, president of the National Association.

Guests at the January 8th meeting included Hoongstsao L. Woo, B.S., Liason Officer, Procurement Group, Chinese Minister of Communications, who is making a study of American procurement methods, Robert Porter, vice president, Walter Wilcox & Furlong Paper Co., and Leo Greenebaum, president, Willmann Paper Company.

* * *

PURCHASING RECORDS FORUM SUBJECT AT SEATTLE

Captain Carl Anderson, USNR, spoke on "Beachmaster in the Pacific" at the January 10th meeting of the Purchasing Agents Association of Washington,

(*Continued on page 212*)

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Moly Shovels, spades and scoops are made in all required types, styles, sizes and weights.
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Water-dispersible—combines residual effect against horn flies with speedy knockdown and high kill of stable flies. Ideal for making fully-effective livestock sprays.

5. AEROSOL DDT

Made only by Hercules and designed specifically for use in Aerosol bombs. Now available in quantity.

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Water-dispersible—for use in spraying barns, city dumps, garbage pails, industrial buildings where the residual effect of DDT is required in the most economical form.

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A general-purpose concentrate for use wherever DDT in oil solution is required.

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in 10 hours!

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EXPORT: THE ARMCO INTERNATIONAL CORPORATION

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STEELOX BUILDINGS

(*Continued from page* 204)

"Know What" that make for efficient procurement. Before going further, it is advisable to analyze the job of purchasing and its basic requirements.

The National Association recently issued a booklet that was prepared at the request of the War Manpower Commission, Bureau of Placement, entitled "Purchasing, A Specialized Field in Management and Administration." If you have not read this booklet you should do so for I am sure that it will broaden your knowledge of your responsibilities. One thing I like in particular is the reference to purchasing as being "A Specialized Field in Management and Administration," a fact that was well borne out during the early days of the war period when the government organizations recognizing that the easily stated "Anybody can buy" belied the fact of accomplishment and efficiency, called upon purchasing experts from all walks of industry, to put government procurement on a high plane of efficiency. We all know the fine record these men established. True, they were big scale men, but they were men with the necessary functional skill.

Behind Functional Skill

What does this functional skill involve? The booklet states that "Professional skill in purchasing is acquired by academic training and practical experience, and is applicable and interchangeable in any field;" that it requires a high degree of skill in management. And I am sure you will gain much satisfaction from the reference to "Purchasing competence at the executive level" which "involves the ability to analyze requirements, and the production or market conditions which determine their availability and cost, and the judgment to translate these conditions into economical and prudent policies which best meet the company's needs."

That is a big order. All procurement is not so ponderous, although as you well know, the efficient purchase of minor equipment and M R O materials often begets tribulations and headaches, and that often the procurement of shelf goods is far from complete upon receipt of bill of materials or requisition.

But, what is back of the purchasing agent's "know how"? We find that the qualifications include college education, engineering with additional training in economics and business administration, practical training in the production, stores, accounting and engineering departments, and practical training in all sections of the purchasing department, plus, according to an executive quotation, executive ability, knowledge of current business conditions, knowledge of materials, production requirements, government controls and commercial law.

All of the foregoing is contingent upon academic training and empirical training —school work and experience. So far, no mention has been made of technological developments, nor of different kinds of materials and equipment, and the processes by which products are made or fabricated.

But to get a clear picture of the purchasing agents qualifications, we must take a couple of steps down. It is stated that the assistant purchasing agent should among other things be a graduate of a university or college with specialization in commerce, engineering; have at least three years' experience in purchasing, plus knowledge of purchasing procedure, distribution, accounting, market conditions, law of contract, development of specifications, ability to meet with the public, be tactful, honest, resourceful, possess keen purchasing and business judgment, skill and discrimination. There is also the suggestion that he should be "of good intelligence."

There's another important link, commonly known as the buyer. His suggested qualifications parallel those of the assistant; he must be able to draw up contracts and specifications, approve specifications drawn by technical writers; approve bills, keep a half dozen kinds of records, have a thorough knowledge of goods purchased, study market conditions, have supervisory ability, judgment and good address, plus tact, honesty, resourcefulness, and good business judgment. And these are the elementary qualifications the P. A. must have.

I have profound respect for the men in purchasing, and as I ponder over the requirements for assistants and buyers, I can't help feeling that they have "got a lot on the ball," but that when it comes to gaining recognition for these qualities and abilities they are more or less behind the eight-ball.

You can correct this condition, for I believe you are concerned with Purchasing Competence at the Executive Level. There is little in the accepted basic principles of purchasing that is not based on academic training and sheer experience, though obviously the basic requirements are indeed comprehensive; and they are of tremendous importance, for men in purchasing spend a large portion or a major portion of company income, according to the nature of a business.

Plus Knowledge

There is another side to this matter of purchasing education also of prime importance. It pertains to that plus knowledge of materials and industrial practices and the ever accruing technological developments which cannot be acquired in schools nor garnered in the ordinary routine of business.

This can only be acquired through progressive education of the highest order. It is self education. I know that sales representatives can give you a world of help. You have got to go much further than depend on others. You must be on the lookout for and study the new developments in products, materials, processes, equipment, methods and finishes.

You can't wait for some body to tell you about them, nor wait until someone in your organization asks you to get information. You have got to keep up with industrial progress. You must be

(*Continued on page* 214)

Now the Director of Purchases Can Help to Reduce His Firm's Selling Costs

—5 New Bulletins Show How

Here are 5 brand-new, informative Bulletins detailing the "how" of mass transportation of industrial loads. They are crammed with pertinent facts showing how the Director of Purchases can aid in reducing his Company's costs of *manufacturing and selling.*

Each Bulletin describes modern techniques of handling *one* type of container—Box, Barrel, Bag or Bale; tells how to assemble *more* of them in Master Unit Loads on Pallets or Skids for economical transportation through warehousing and manufacturing, and final delivery to customers.

You can pioneer in bringing this new profit idea to your Management—by requesting the 5 Bulletins today on your Company letterhead or this coupon.

The Elwell-Parker Electric Company, 4519 St. Clair Avenue, Cleveland 14, Ohio.

Clip, attach to your letterhead, and mail to Elwell-Parker, Cleveland:—

Send your 5 Industrial Logistics Bulletins to

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SUMMERILL
LIGHT-WALL TUBING
answers countless problems

Designers and production men throughout industry are finding new uses and new applications for Summerill seamless steel light-wall sections at a rapidly expanding rate. The extremely high quality and uniformity required in producing tubing that we cold draw to wall thicknesses as light as 1% of the OD, are of obvious value to those who are concerned with the forming, corrugating, bending or other working of the metal.

As to the uses of Summerill light-wall sections, they range from fishing rods to X-Ray machine parts—aircraft engine intake stacks to fountain pens and pencils—Bellows valves to bicycle parts. With ODs ranging from 1/16" up to 4", a wide selection of ferrous analysis and heat treatments giving physicals as high as 180,000 psi, there is literally no limit to application possibilities. Why not call on Summerill engineers for a discussion of your problems?

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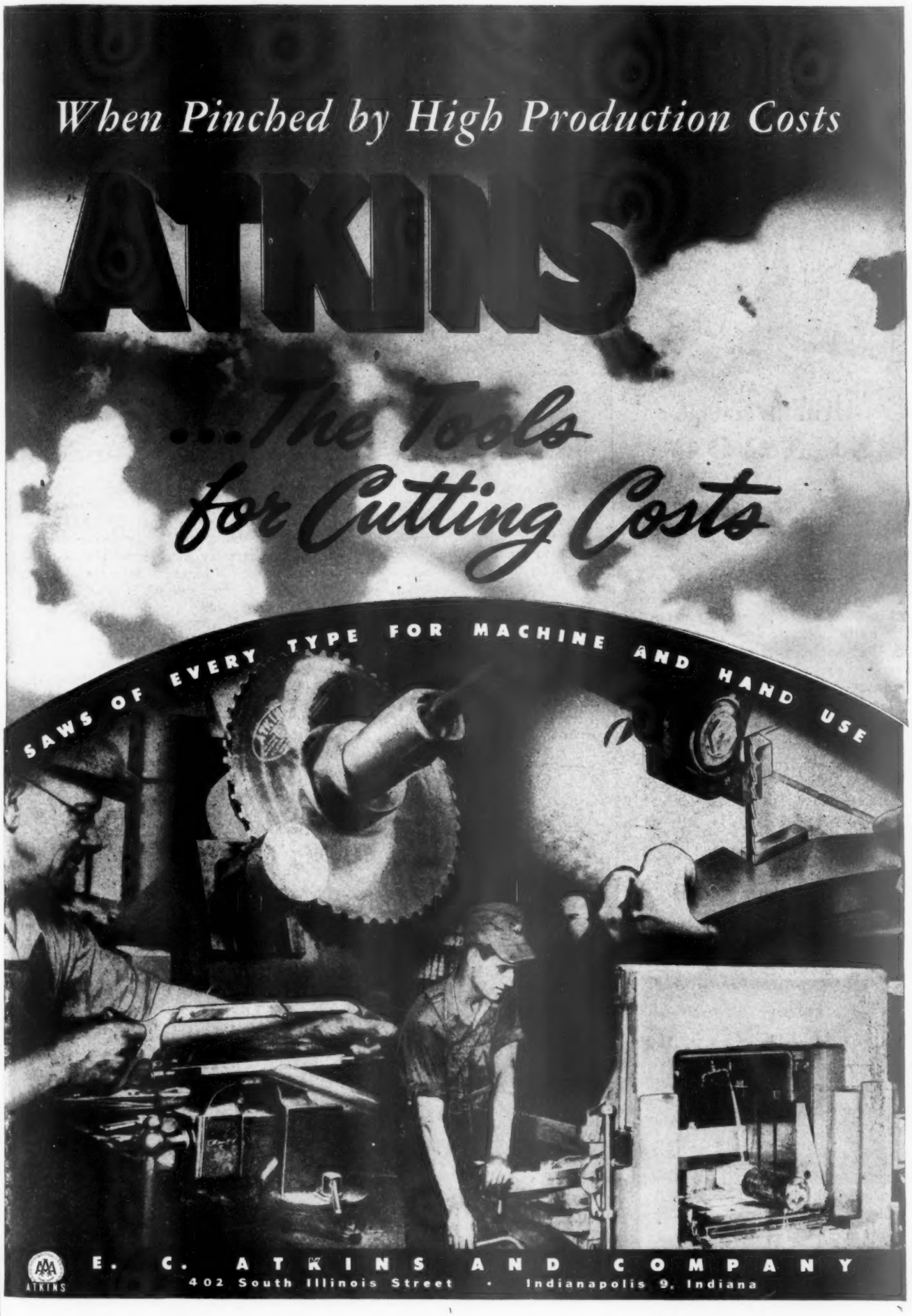
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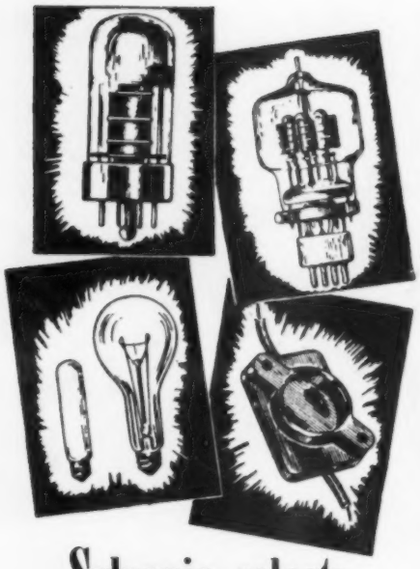

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Sylvania Electric Products Inc. . . . one of the big manufacturers of electrical and electronic devices such as those pictured above . . . uses Sunroc Water Coolers for the comfort and convenience of its workers.

This manufacturer, like so many other leaders in American business and industry, knows the importance of good drinking-water in furthering satisfactory employee-relations. Sunroc Water Coolers were chosen because of their noteworthy efficiency, dependability, and economical, trouble-free operation.

Today's Sunroc Coolers are the result of years of specialization. There's no finer cooler on the market today. There are Sunroc models adapted to your specific needs, whether your establishment is a small office, or a concern employing, or catering to, thousands. Get full details by writing Dep't **P-2,** Sunroc Refrigeration Company, Glen Riddle, Pa.

"There's nothing like a cool drink of water"

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DISTRICT COUNCIL MEETING AT INDIANAPOLIS

The district council meeting of the N.A.P.A. Fourth District, was held November 2nd at the Columbia Club, Indianapolis, Ind. The meeting was called to order by Vice President Leslie E. J. Stonehouse, purchasing agent for the Westover-Kamm Co., Bay City, Mich., with the following in attendance: John M. Horton, Dow Chemical Co., Saginaw, Mich.; A. N. Phillips, Schwitzer-Cummins Co., Indianapolis, Ind.; C. A. Boss, Administrative Purchasing Officer, Lansing, Mich.; Harold A. Berry, American Steel Dredge Co., Fort Wayne, Ind.; Roy F. Harvey, Sealed Tire Corp., Muskegon, Mich.; G. R. Smith, American Rock Wool Co., Fort Wayne, Ind.; John M. Berry, Kennedy Tank & Mfg. Co., Indianapolis; R. G. Matley, Whitman & Barnes Co., Detroit, Mich.; Wm. M. Ferguson, Winters & Crampton, Grandville, Mich.; Mrs. Katharine Gaither, Secretary, Indianapolis.

The Indianapolis Association held its third monthly meeting at the Columbia Club on November 20th, the program being in charge of W. R. Murphy of the Central Rubber & Supply Co. The guest speaker was E. F. Tomlinson, general manager of the B. F. Goodrich Company's Industrial Products Division. Mr. Tomlinson gave an unusually interesting talk on the big job done by the rubber industry during the war, and its spectacular plans for the future. There were only two questions to which he had no answer, according to T. D. McConnell, namely, "When will tires be plentiful?" and "What happened to Ohio State when they played Purdue?"

(*Continued from page* 204)

Seattle, Wash., at the Washington Athletic Club, and Marvin R. Patterson, architect, and member of the Seattle Municipal League, spoke on "Proposed New City Charter."

"Purchasing Records" was the subject of form preceding the dinner meeting, presided over by Russell Wetherell, chairman of the association's educational committee. Speakers were C. L. Burton, P. A., Guy F. Atkinson Co.; Harold D. Mitchell, P. A., Housing Authority of King County, and Stephen B. White, P. A., Seattle Hardware Company.

LARGE ATTENDANCE AT LOUISVILLE CHRISTMAS PARTY

The Purchasing Agents Association of Louisville, Ky., adjourned all business at its December meeting held at the Kentucky Hotel on the 18th, to hold its annual Christmas party. Prizes were awarded to each member of the team winning the association's attendance contest for the September, October and November meetings, the winning team being headed by Harold Borders of the Reynolds Metals Company, which had the envious record of having every member in attendance for all three meetings with the exception of one man who was out of town on a business trip at the time of the November meeting.

QUINCY SHIPYARD ACTIVITIES BOSTON MEETING

John T. Wiseman, general manager, Quincy Shipyard of the Bethlehem Steel Co., discussed the war time accomplishments at the yard in the building of warcraft, at the January 8th meeting of the New England Purchasing Agents Association held at Schraffts. Secretary H. J. Graham reports five new membership applications, two of which are transfers.

If you make it of WIRE *make it of the best!*

FOR over a century we have produced steel wire of superior quality for more than 160,000 different manufacturing uses.

In the more than 400 different types of wire we manufacture, you'll find not only the wire exactly right for your needs, but the best wire of its kind produced anywhere.

Here is wire in all its old familiar forms, and in some forms entirely new. Round wire, flat wire and wire in every variety of shape and size. Wire that is hard or soft, stiff or ductile. Wire for nails, screws, nuts, bolts and bobby pins. Wire for upholstery springs, tire chains and paper clips. Wire for brushes, piano strings or for rubber reinforcing. Plain wire, tinned wire or bright finished. Wire of every steel analysis—carbon, alloy or stainless steel. Wire, vastly improved by its war service, better able than ever before to do a better job in your peacetime applications.

To help you select—and use—the wire best suited for your purpose, the cooperation of our wire specialists is freely at your service. Despite a tremendous backlog of orders, we'll do our best to supply your needs.

American Steel & Wire Company
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United States Steel Export Company, New York
UNITED STATES STEEL

- Supplies quickly and accurately quality collets and feeders that meet your requirements.
- Makes standard and special collets and feeders for all automatics, lathes and milling machines.
- Features diamond serrated collets that grip tighter with less tension — are self-cleaning — reduce spoilage.

"Only Sutton Collets are Diamond Serrated"

SUTTON TOOL COMPANY
STURGIS, MICHIGAN

SUTTON COLLETS

(*Continued from page* 208)

intimately acquainted with the materials that go into the things you buy, and the methods and processes that go into their production. Technology is not standing still. You must know about the new developments as they affect the things you buy or the things your company makes.

This matter of keeping ahead of most of the people in your organization by keeping abreast of the times, is one of the greatest opportunities you have of establishing Purchasing in the front row and stabilizing it at the executive level.

Must be First

You fellows have got to be the first to know what and know how. And you can rest assured that once you have acquired a reputation for knowing things, that management and production and planning and sales will come to you for information and help. They will respect your ideas. Do not overlook that human failing of "letting George do it," bearing in mind that few persons "have the time" (so they say), or the inclination to dig into things.

Purchasing offers rich rewards to the men who know. There are many men in purchasing whose incomes run into five figures of good proportions, and whose income tax headaches and heartaches are heavy. These men not only know the basic principles of purchasing, the economic factors involved, and the managerial requisites. They know their plants and the equipment of those plants; they are familiar with production requirements and the end use requirements of the products.

Today they are capitalizing upon the lessons in more efficient procurement taught by war conditions — more effective scheduling, quicker material turnover, smaller inventories, lower cost material handling, more productive subcontracting, and the initiating of policies and programs that assure lower material and production costs.

Your responsibilities are merely beginning when you get a requisition or bill of materials. Your interpretation of your procurement job and your progressiveness will determine whether you will be an efficient rubber stamp, or exhibit purchasing competence at the management level.

What Purchasing Leaders Say

Here are comments by leaders in the field of Purchasing, emphasizing the importance of progressive education. Ed Scully, former vice president of the Eighth District of the National and a purchasing agent of the first water, states, "I should think the universal objective of men in purchasing is to reduce costs, not prices alone mind you, but costs in the end products. You might reduce prices by competitive bids, but that is elementary. If on the other hand you can show your design engineer or your production manager that carbon steel can be induction hardened as a substitute for alloy or tool steel in a

(*Continued on page* 216)

No "WOBBLE-WORRIES" with Corbin-Phillips Screws

Anybody who has driven ordinary slotted screws with a power driver knows the "*wobble worries*" — a persistent fear that the driver will slip and mar the work. Wobble Worries slow production, cause fatigue and irritation.

There are no Wobble Worries when you furnish Corbin-Phillips Screws, because the hardened steel driving bit is held firmly in the Phillips Recessed Head, surrounded and *centered* in a firm grip that insures *straight-line driving*. Production increases, fatigue decreases . . . profits show up.

Add Corbin uniformity, and you have one answer to higher wages with lower selling prices.

CORBIN SCREW DIVISION
The American Hardware Corporation
NEW BRITAIN • CONNECTICUT
Warehouses:
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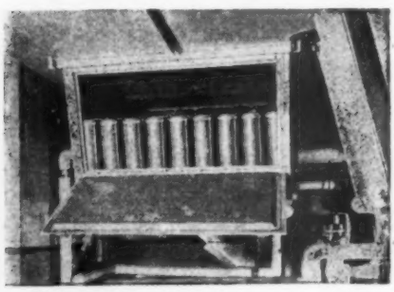
CORBIN PHILLIPS Screws

Equipment and Engineering Service for Controlling 1. air quality and 2. air distribution . . . economically.

1 Dorex controls air quality:
Dorex Air Recovery Equipment in heating, ventilating, air conditioning, or combined systems, controls air quality by removing gaseous and odorous impurities from the air in recirculation, or air intake, and cuts air conditioning cost by permitting re-use of more indoor air.

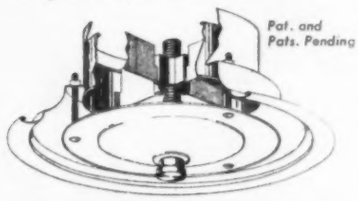


Assembly of Dorex Canisters in air duct so arranged that all air to be treated passes uniformly through the activated carbon which extracts the impurities. There's a Dorex canister or panel installation ready for most heating, ventilating or air conditioning systems. Portable units are also available for eliminating localized or intermittent concentrations of odors or gaseous impurities.

Works like a gas mask

It adds nothing to the air. Gaseous odors and contaminants are removed, not disguised. Activated carbon, the agent used in Dorex, is the most powerful adsorption material known. It has been used for many years in industry for the recovery of chemicals in vaporous and gaseous form from air. Dorex installations give positive control of odors by removing gaseous impurities.

2 Kno-Draft controls air distribution:
Kno-Draft *Adjustable* Air Diffusers control air motion and mixing by regulating air direction and volume. They efficiently handle large volumes of air at higher duct velocities which permits smaller ducts and fans and reduces operating costs.



Type K Adjustable Diffuser with Type D Volume damper. Every Kno-Draft Diffuser can be adjusted for seasonal, individual or production requirements. Any angle of air direction desired from vertical to horizontal can be obtained by turning the air adjustment screws (easily accessible from under the unit). Any desired volume can be obtained by adjusting hand turning knob under the unit.

Kno-Draft Diffusers blend with architectural treatment. They are especially adaptable for open duct work or high ceilings and insure efficient air distribution, thorough air mixing and draftless, noiseless air diffusion.

Engineering help available

The W. B. Connor Engineering Corp. maintains a staff of specialists and district representatives in leading cities to assist you in applying the advantages of Air Recovery, Air Quality Control and efficient Air Distribution to any system you may be altering, using or designing. For full information and quotation on Dorex and Kno-Draft Equipment call the nearest District Representative or write Dept. P2, 112 East 32nd Street, New York 16, N. Y.

W. B. CONNOR ENGINEERING CORP.

AIR RECOVERY • AIR PURIFICATION • AIR DIFFUSION

112 East 32nd Street — **New York 16, N. Y.**

(*Continued from page* 214)

given application, you have applied your progressive education and reduced the costs." He calls attention to the fact that the University of Maryland has opened three new schools — World Economics, Business Research, and Industrial Research. "The campus technicians will serve industry by research on new materials, new uses, marketing conditions, suppliers and production," he explains, and says, "That sounds to me like a swell course in Purchasing education—progressive education."

Charles L. Sheldon, president of the N.A.P.A. states, "It is absolutely necessary that the Purchasing Agent keep abreast of new developments that he may keep his company in competitive position. Purchasing agents will have to sift the wheat from the chaff among the new materials, proposed substitutes and processes in order that they may best serve their companies and the planning, production and sales departments.

G. W. Aljian, West Coast vice president, says: "We should be in complete touch with every change contemplated in production, quantity or style of our company's products, and with every change in our company's manufacturing processes. We should be constantly studying substitutes and synthetics and the host of new processes which will be available in the coming months.

Another writer declares, "The Purchasing Agent must keep an open mind and an actively searching mind for new materials adapted to his company's use—and perhaps his greatest contribution to efficient and profitable management lies in initiating the use or trial of alternative materials, methods and equipment."

Requirements More Exacting

Owen D. Story of Houston, Tex., vice president of District No. 2 of the National states, "The Purchasing Agent must constantly keep himself aware of the many new developments in the manufacture of products." And, declares Mr. Story, "He must consider well his inventory position, as, since all the resources of the country are now returned to the development of new ideas, he may find himself with a stock of materials that is obsolete almost by the time he gets it in stock. The requirements of the purchasing profession are now more exacting than they were during the war."

Robert L. Swanton, past-president of the National stated "There are all of the new inventions held back for the war years which will be available for peacetime use. Larger still, there are the new products, processes and facilities developed for war purposes that will be adapted to commercial use."

A. W. Zackey, current vice president of District No. 8, declares, "No man in an industrial enterprise has the opportunities to serve and improve his company as has the purchasing agent."

These leaders in Purchasing all urge that every purchasing agent take advantage of the new opportunities made possible by new developments. Bear in

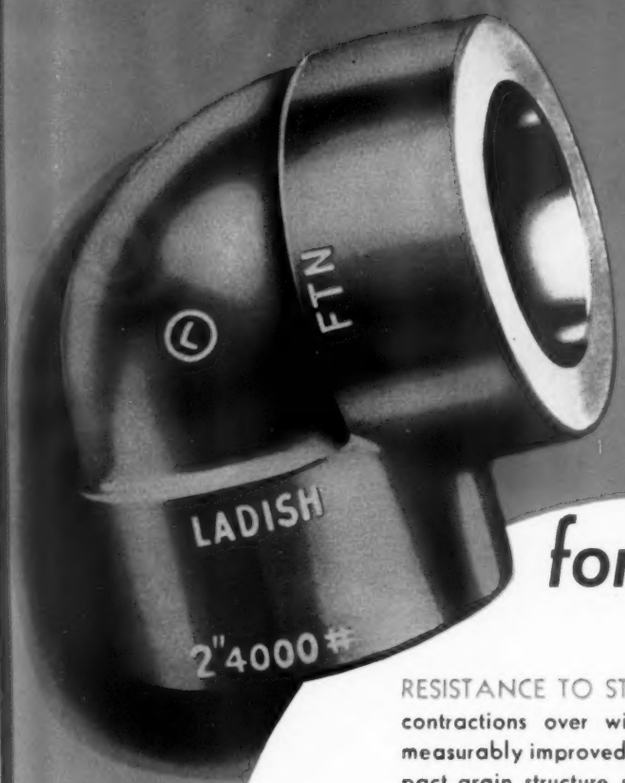
(*Continued on page* 220)

PIPE FITTINGS

Drop Forged

by LADISH

for Greater Dependability



RESISTANCE TO STRAINS of expansion and contractions over wide temperature ranges is measurably improved with the tougher, more compact grain structure provided by Drop Forging.

RESISTANCE TO FATIGUE is accomplished by accurately controlled grain flow for maximum strength at vital points provided by Drop Forging.

RESISTANCE TO SHOCK of hydraulic pressures is materially improved by increased dynamic strength and toughness of metal produced by Drop Forging.

FREEDOM FROM INTERNAL DEFECTS is assured by the denser, more homogeneous metal structure of Drop Forgings.

UNIFORM WELDABILITY
FREEDOM FROM LEAKS
LONGER LIFE

TO MARK PROGRESS

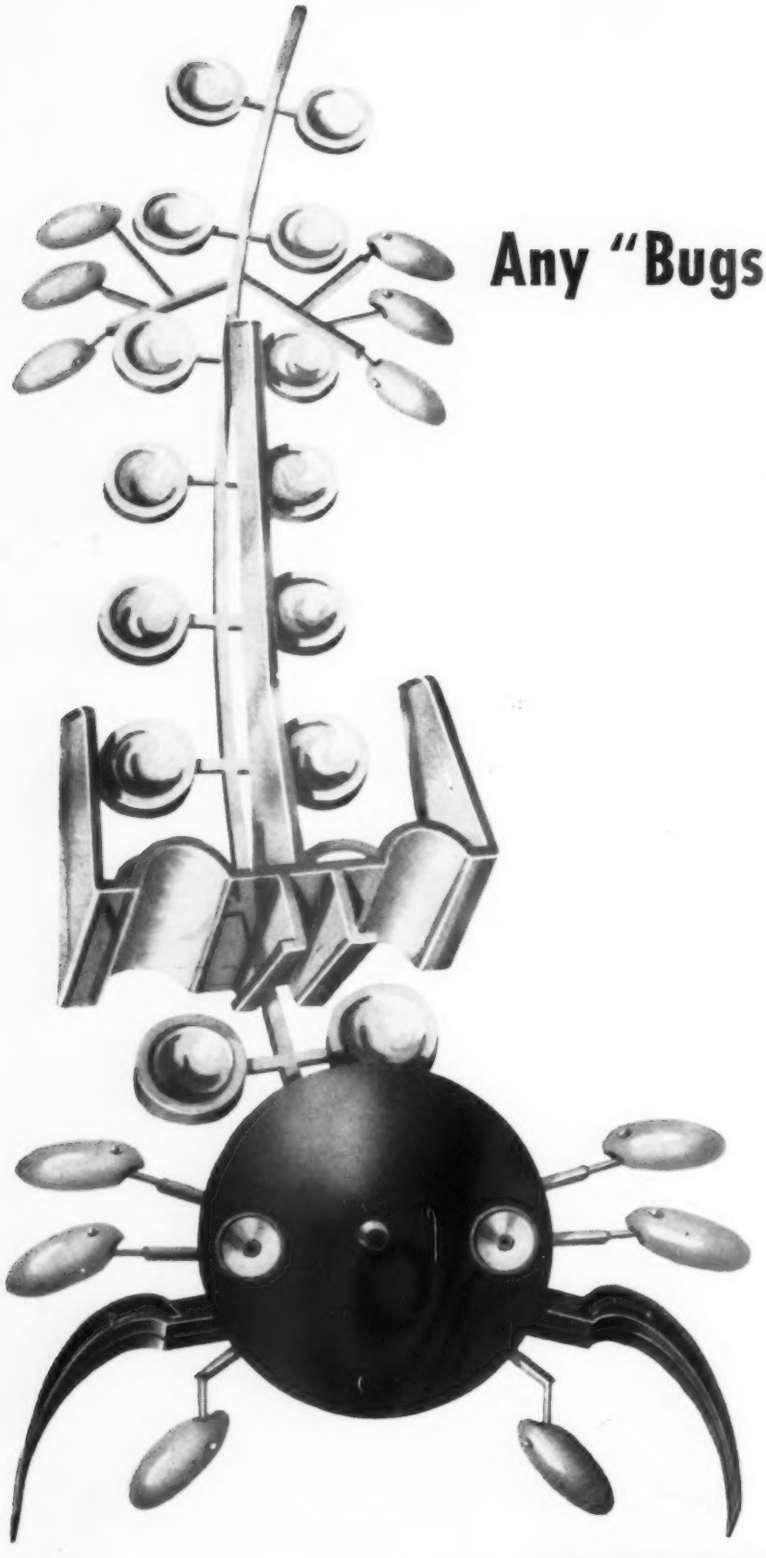
ARMY E NAVY

FITTINGS DIVISION

LADISH DROP FORGE CO.

CUDAHY • WISCONSIN (MILWAUKEE SUBURB)

District Offices: NEW YORK • PITTSBURGH • CLEVELAND • ST. LOUIS • HOUSTON • LOS ANGELES



Any "Bugs" in your Product?

If there are, you don't have to send out "feelers" to see if we'll help you out. Exterminating the "bugs" in new products is a job that Continental's Plastics Division is often called on—always glad to do.

Bank on it—our staff of engineers, designers, researchers, is well-equipped to untie your knottiest problem. Long years of experience in working out new products for some of America's best-known manufacturers has given them the necessary plastic "know-how."

The insect alongside shows several examples of Continental's plastic magic. His body is made of flashlight lenses . . . the feet are fishing lures . . . the wings are acid baffles . . . the claws are coffee maker handles . . . the head is a distributor and coil part.

But the list is endless. Set all the plastic items we make on paper and they'd fill this page. Best thing about it, each new day brings a new use. Perhaps plastics and Continental's plastic engineers can help *you* improve or develop your product. Why not drop us a line?

Tune in: "CONTINENTAL CELEBRITY CLUB" *every week over coast-to-coast CBS Network*

OTHER CONTINENTAL PRODUCTS: Metal Containers • Fibre Drums • Paper Cups • Crown Caps and Cork Products • Machinery and Equipment.

• • •

FIGHT INFANTILE PARALYSIS • JAN. 14-31

CONTINENTAL PLASTICS DIVISION

CAN COMPANY, INC.

HEADQUARTERS: Cambridge, Ohio

Sales Representatives in all Principal Cities

COMPRESSION • INJECTION • EXTRUSION
SHEET FORMING • LAMINATION

Try the New FLEXARC SW-2 ELECTRODE (A KING-SIZE SW) — on the House!*

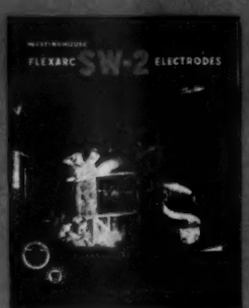
It's the "operator's own electrode"—the new Flexarc SW-2—developed by Westinghouse in diameters from $\frac{3}{16}$" to $\frac{5}{16}$" because of the widespread demand for the smaller diameter SW electrodes.

This new cost-cutting electrode gives extra footage of weld because of its flat fillet contours. The SW-2 has smooth uniform metal transfer with full side wall wash up. It gives equally good results—with a-c or d-c in all positions—on wrought iron, low or medium carbon steel, low-alloy, high strength steel, copper bearing steel and on low and medium carbon cast steel.

Both operators and supervisors are invited to check these facts on their own production—using the free samples which will be sent on request. J-21368

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

FLEXARC ELECTRODES



Send for this new booklet. Gives complete details of SW-2 performance, time and cost reduction. Ask for B-3710.

GET FREE SAMPLES OF SW-2 ELECTRODES

Try these new electrodes on your own jobs. They're unexcelled for—

All-position welding—single or multiple-pass fillets and butts, with a-c or d-c—

Flat contours without undercut, yield more weld footage per pound of electrode—

Self-freeing slag characteristics—cuts cleaning time with a resultant saving—

Easy manipulation and striking characteristics in open or close welding spaces—makes the operator's job easier—

Excellent root penetration with unusually good x-ray welds.

Ask for your *Free Samples* . . . specifying diameter used . . . on your company letterhead . . . to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

"ALLIED engineers worked hand in glove with our purchasing department"

The quarter century experience of Allied's engineering and production staffs in steel fabrication guides orders through the Allied plants in record time and with due consideration of purchasing agents' cost schedules.

Plant facilities are ideal for fabrication of mass tonnage to exact specifications. Many thousand tons of "made-to-order" structural steel roll from the shops annually.

Consult Allied on *your* next purchase of fabricated structural steel. You will find costs reasonable, deliveries on schedule whether your requirements are for one ton, a thousand tons, or more.

Bomber Assembly Plant, one of the world's largest buildings. 29,681 Tons of structural steel delivered at the rate 8,000 tons per month.

ALLIED

STRUCTURAL STEEL COMPANIES

Engineers • Fabricators • Erectors

- Clinton Bridge Works, 101 S. Second St., Clinton, Iowa
- Gage Structural Steel Co., 3123-41 S. Hoyne Ave., Chicago 8, Ill.
- Midland Structural Steel Co., 1300-20 S. 54th Ave., Cicero 50, Ill.

Address the company nearest you

Three companies, with total structural steel capacity of 75,000 tons, who have pooled their facilities under centralized control and responsibility.

(*Continued from page* 216)

mind that you have an added responsibility, namely, that of Purchasing for Profit, a new responsibility that takes you personally through planning, through production and through sales. You may question the scope of this assignment, but I shall merely ask one question: How can you do the best job of purchasing if you are not intimately conversant with these factors and the end use of the products your company is making? You can either take the leadership, or have someone tell you what to buy.

Fifty Years in Five

It is stated that the war years have marked the birth of fifty years' of technological progress in the brief span of five years. Technics have been improved and broadened; techniques have become more specific looking to greater accuracy and efficiency, and technologies likewise materially enhanced. And I presume that tectonics, the science or art of construction of implements, ships, buildings, etc., should be included. It is your responsibility to keep abreast of these four T's. Bob Hawk would say you have got to think more of your T-zone.

Most of the new developments may not concern your company's operations; many will. It is your job to concentrate upon those that affect the operations of your company and your suppliers in any way, shape or form. Your suppliers and your contractors cannot give you the best quality, prices and service unless they too are on the beam so far as these new developments are concerned. You will have to make changes in your supplier lists, discriminating between those that are up-to-date and those that are still using pre-war methods, materials and processes.

Giving Competitors An Edge

Negligence or lack of knowledge on your part may be giving the competitors of your company an edge because they may know of the new developments and key their procurement program accordingly.

There are good reasons why men in purchasing should have engineering and production experience. It enables them to understand equipment and processes and material utilization. I know some purchasing agents that can take screw machines, lathes and drill presses apart and put them together again. And I know purchasing agents who buy machine tools and other equipment, who cannot explain the difference between an engine lathe and a turret lathe. Some glibly talk about plastics, but can't tell you anything about selection and utilization.

If you are going to keep Purchasing on top, you must have "Know How" and the "Know What." There is only one way to learn about new developments. It is by self-education, or progressive education.

I know that you are interested in current subjects of importance. It has been my pleasure to attend your meeting on lumber, steel, ceramics, high frequency

(*Continued on page* 222)

BESLY TAP SERVICE
Across the Nation

With the swing to peacetime production, stocks of Besly Taps are now available at conveniently-located distribution centers throughout the nation . . . and Besly's industry-trained field men are on the move to assist you in matching the right tap to your job requirements. *Write today on your own letterhead for copies of the new Besly Catalog and Tap Manual.*

BESLY

BESLY TAPS • BESLY TITAN ABRASIVE WHEELS
BESLY GRINDERS AND ACCESSORIES

CHAS. H. BESLY AND COMPANY, 118-124 N. Clinton St., Chicago 6, Ill., Factory: Beloit, Wis.

The Name That INDICATES

Standard for ACCURACY

The name "STARRETT" on the face of Dial Indicators is positive assurance of lasting satisfaction any way you look at them — design, workmanship, operating convenience, easy reading qualities — Starrett Dial Indicators measure up to your most critical standards. Ask your mill supply distributor to show you Starrett Dial Indicators and Starrett "LAST WORD" Indicators adapted to your requirements or write for Starrett Dial Indicator Catalog P.

THE L. S. STARRETT CO., ATHOL, MASSACHUSETTS, U. S. A.

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES

(*Continued from page 220*)

heating, magnesium, and plastics. But I am wondering how many of you follow through on subjects of interest, after sitting through a short session.

You had a fine speaker on plastics. It is a subject that is of concern to every person here regardless of the nature of his or her business. Their application is broad, involving merchandising products and mechanical products, adhesives, coating and impregnating materials for textiles and other base materials; protective packaging and merchandising packaging. What do you know about their physical qualities, costs, heat limitations, and so on? Are you watching developments in Nylon — products of course, the several vinyl plastics, and the styrenes?

Did you follow through on magnesium? You may not have a production use for it, but you may have to buy equipment in which it is employed. How can you buy intelligently if you are not familiar with the product being bought?

Your meeting on high frequency heating was of much interest. Do you now have at least a talking knowledge of induction heating and di-electric heating? Did you make comparison of methods and costs of other processes for doing similar work.

Many purchasing agents are giving serious thought to materials handling, for they realize that the handling and re-handling of materials ups costs. A Western Electric engineer estimates that a ton of material is handled at least twenty times from unloading, through manufacturing, and finished product handling. That means that for every ton of material bought, at least 20 tons may be handled. It is a fruitful place for cutting costs.

By-products of Nuclear Fission

Have you considered having a speaker tell you about the by-products of atomic bomb production, in the form of new coolants, new lubricants, new packing, new pumps, and new instrumentation? It is estimated that the benefits accruing to industry over a period of 20 years through the use of new pumps and techniques will alone offset the tremendous investment in the nuclear fission project.

There are numerous other important developments. Let's consider a few of them. Important ones have been announced in thermal and electrical insulations. There is Nubun which U. S. Rubber says paves the way for new types of wire and cable with improved electrical and physical qualities. Foamglas, developed by the Pittsburg Corning Co., each cubic foot of which contains 10 million air cells, which is fireproof and vermin proof, in addition to offering unusual insulating values. Flotofoam, a cubic foot of which weighs a pound and a half and which can be made as light as ¾ pound per cubic foot. Foamplastic, which will foam to 30 times its original size by self-generated heat. Then there are the amazing silicones developed by

(*Continued on page 226*)

Wheeled Units Get to Danger Spots in a Hurry

Easy to push and to maneuver, yet packing a terrific fire-fighting wallop, Kidde Wheeled Units are especially suited for protecting hazards too severe to be handled by hand extinguishers.

All Kidde Wheeled Units are supplied with two large wheels that make for ease of pushing and speedy movement, and with additional small wheels that simplify maneuvering.

No pump or other equipment is needed for operation. The carbon dioxide is discharged under high pressure by its own stored energy through the shielded Kidde nozzle.

Units are built with carbon dioxide capacities of 50, 75 and 100 pounds. Full details are available, on request, from Walter Kidde & Company, Inc.

WANT TO BRUSH UP ON FIRE PREVENTION METHODS?

"Fire — and How to Fight It" packs the story into 36 down-to-earth pages. Write for copy (free, of course).

Walter Kidde & Company, Inc., 250 Main Street, Belleville 9, N. J.

Kidde

FIRE-FIGHTING WALLOP... ONE-FINGER CONTROL!

15 pounds of flame-killing carbon dioxide . . . controlled by a single finger. A novice can operate — just aim at fire, pull trigger.

Mail and Phone Orders Filled

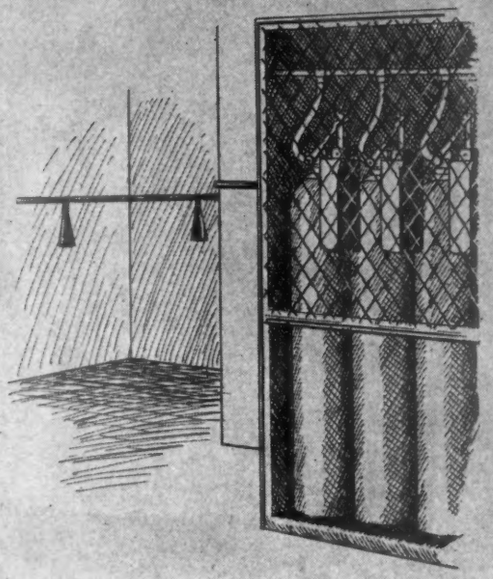
Kidde

SAVES RECHARGING DOLLARS

No annual recharging with *this* water extinguisher! Reaches full range *instantly*. Maintains constant start-to-finish discharge rate.

Mail and Phone Orders Filled

Kidde



Made-to-measure extinguishing systems

Engineered by Kidde to protect specific fire hazards in flammable liquids, electrical equipment. Automatic or manual operation. Can fill enclosed space with carbon dioxide or direct discharge at specific danger spot. Can be designed to protect several hazards from one bank of cylinders. Details on request — write us about your problem.

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

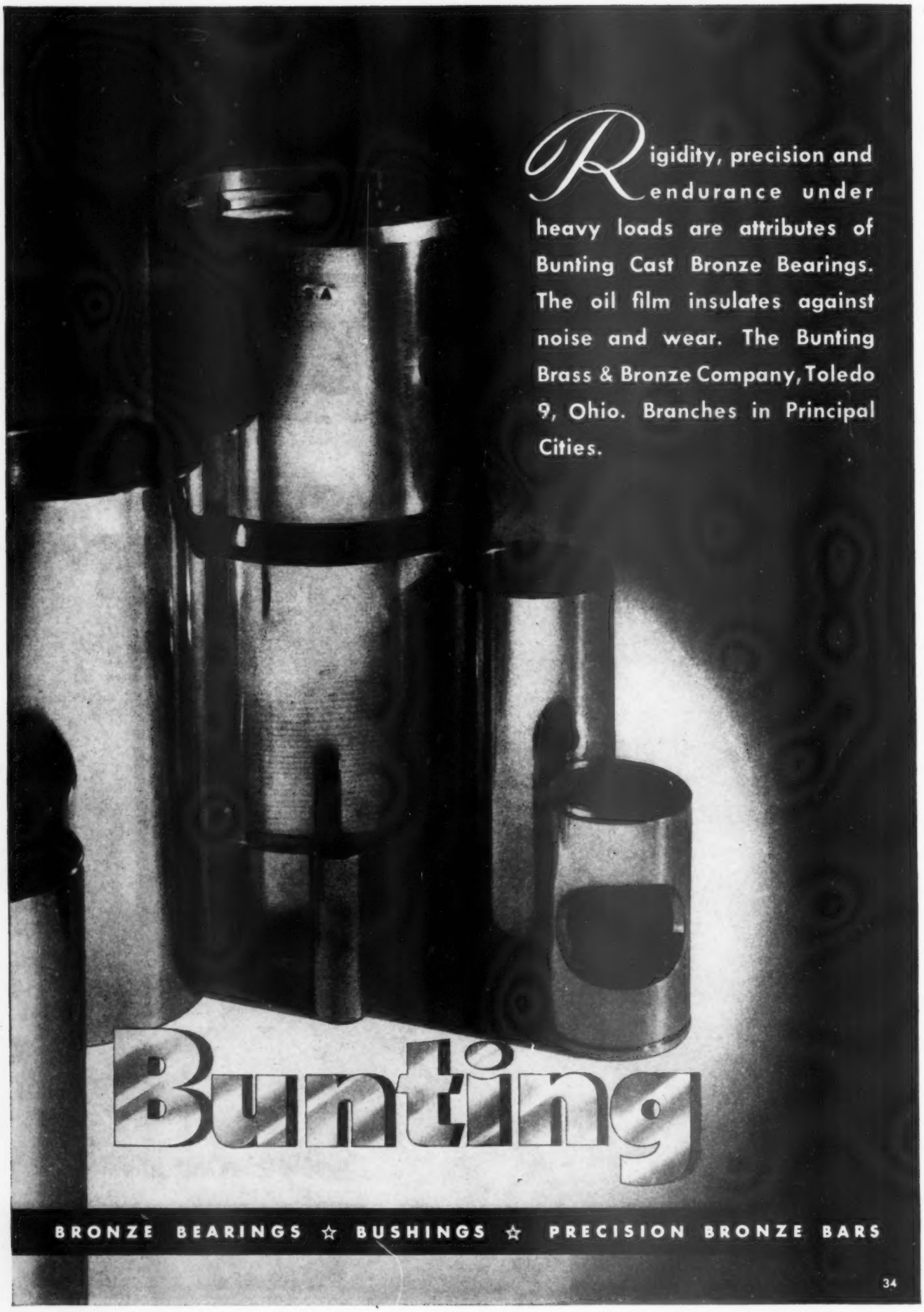
Walter Kidde & Company, Inc. • 250 Main Street, Belleville 9, New Jersey

Citizens Union

General output at factories and mines decreased 4 per cent in October, while in the first half of Novemb[illegible] basic in-

'Officer' Scans

stationed in a little town in France for several months, wooed a French girl by telling her about


Rigidity, precision and endurance under heavy loads are attributes of Bunting Cast Bronze Bearings. The oil film insulates against noise and wear. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in Principal Cities.
Bunting
BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS
34

WHY THE PARKER TRIPLE

is leak-tight and vibration-proof

These are exclusive and patented Parker features:

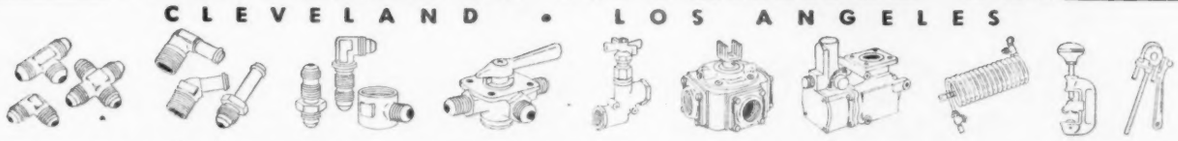
1. The angle of the flare is scientifically determined, to provide maximum clamping surface, with equalized pressure all around—for a leak-proof connection that stands high pressure.
2. Body, nut and sleeve take all the stress and strain from the tubing and flare, and give full protection against the effects of shock and vibration.
3. Inside diameter of coupling is uniform with that of tubing—for streamlined flow—no obstructions or pockets to cause turbulence.
4. Parts are self-aligning and completely interchangeable—for easy installation or disassembly.

There are the reasons why the design of the Parker Triple Coupling is the universally accepted standard for Army-Navy aircraft—the most exacting of all services—and why they insure perfect performance in all industrial applications.

Send for Catalog 201-C—for complete data on steel, brass, stainless or aluminum couplings—⅛" to 1½"—standard or heavy weight. Ask your Jobber, or address The Parker Appliance Co., 17325 Euclid Avenue, Cleveland 12, Ohio.

THE PARKER APPLIANCE CO.

CLEVELAND • LOS ANGELES



FLUID POWER PRODUCTS FOR ALL INDUSTRY

FASTENERS

for Farm Machines

IF your products wind up down on the farm, where hard treatment, vibration and exposure to the elements subject them to undue punishment, it will pay you to specify GENERAL when ordering fasteners.

Not only will GENERAL fasteners speed your assembly lines, they will contribute greatly toward the better end-product. Bolts and screws with uniformly clean, sharp threads, straight shanks and deep, true-centered slots, nuts with accurately centered holes tapped straight and clean, with true wrench fit sides, hex or square, assure new ease of assembly. The process by which GENERAL fasteners are mass-produced offers you the utmost in economy *plus* additional strength for a more solid, vibration-proof product.

GENERAL products are well fitted for virtually every type of fabrication, and measure up especially well to the exacting demands of agricultural equipment production. Next time you buy—Specify GENERAL.

Some of Our Products

MACHINE SCREWS
CAP SCREWS
CARRIAGE BOLTS
MACHINE BOLTS
STOVE BOLTS
STEP BOLTS
NUTS OF ALL TYPES and SIZES

General Screw products are used for thousands of applications in scores of industries—everywhere bolts and nuts are specified.

GENERAL SCREW MANUFACTURING CO.
1238 W. MONROE STREET • CHICAGO 7, ILLINOIS

(*Continued from page 222*)

Dow Corning, compounds of silicon and oxygen. They are produced as liquids and solids; as molding materials, as rubber-like materials, as lubricants, as greases, and as insulating materials.

Silicone insulation makes possible the building of lighter and better electrical equipment, motors that will continually operate in ambient temperatures up to 400 to 450 degrees. Using silicone insulation, Westinghouse engineers redesigned a 3 hp motor to produce an output of 10 hp.

Unique Lubricant

There are several new developments in lubrication. The California Research Corporation, a Standard of California subsidiary, has developed an oil which thickens when heated and thins when cooled. It is still in the laboratory stage. It is said that its viscosity can be tailored to behave in almost any manner, or even made to ignore temperature changes.

Chromium plated bearing surfaces are now factual through a method of plating that provides a porous or microscopically eroded surface which holds sufficient oil for thorough lubrication.

Yale University has developed an adjustable speed alternating current motor that is said to have a complete speed range, which permits the slowing down of machinery without changing gears, belt or pulley ratios. It has a special control circuit that is said to help reduce the amount of equipment required for such a device, and the cost is claimed to be less than half that of any other combination of machines which might perform similarly.

Industrial developments in electronics offer you a fruitful field. You may find it well worth while to thoroughly analyze electronics from the standpoint of current control, voltage control, work positioning, positioning of work in motion as in printing, power rectification, and power factor control. There are also the potential industrial uses of radar, and such matters as spectrophotometry for color determination, metallurgical fluoroscopy, and the electronic microscope with a magnification power of 100,000 times.

In the field of prime movers you may find it worth while to study developments in the gas turbine. Metals have been developed that will withstand the terriffic heats engendered up to more than 1600 degrees. Development is said to largely depend upon the fuel that can be used. It is stated that if coal can be directly or indirectly used, possibilities of the gas turbine are felt to be unlimited in the stationary power field.

Thousands of New Developments

There are literally thousands of new technological developments. Many are concerned with the things you are buying materials for, or components you may be buying. There are a dozen synthetic textiles; new motors, new papers, synthetic rubbers. Powder metallurgy or

(*Continued on page 228*)

PAX TAPE PROFITS ARE BIGGER
PAX TAPE QUALITY IS BETTER

These two smashing facts are taking the trade by storm.

PAX TAPE profits top anything in the tape industry... *by a wide margin.*

PAX TAPE profits can be figured in a jiffy . . . with the new simple discount schedule.

PAX TAPE quality is unconditionally GUARANTEED...to wholesaler, dealer, consumer.

All Size Rolls . . .
Immediate Delivery

*

Another PAX First

Having been the first to break the discount bottleneck — PAX now leads off with the first real money-making DEAL ever offered to dealers.

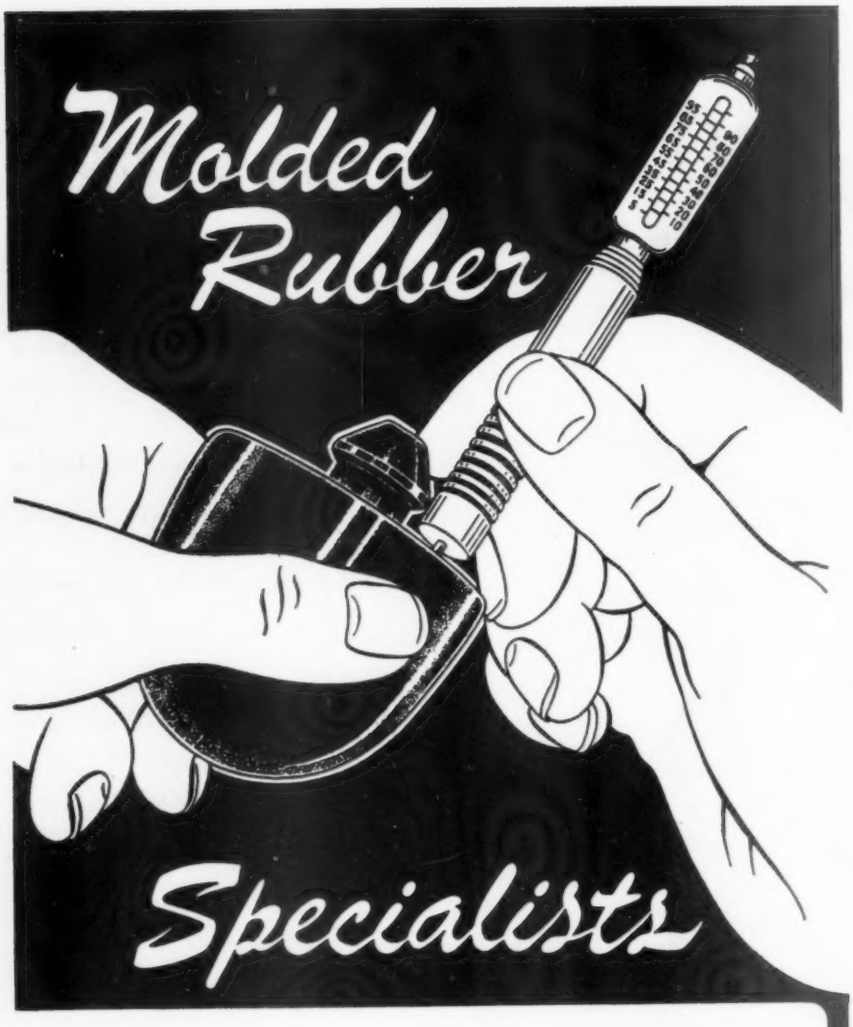
PAX BIG "66" DEAL

***With Display Cabinet* FREE**

. . . it's a money maker!

Send for the facts NOW

THE COFAX CORPORATION • Lynbrook, N. Y.



BECAUSE Continental has specialized in molded rubber products for over forty-three years, you will find them of real help in working out the correct design, the preferred compound and the proper method of manufacture.

When you have molded rubber problems consult your Continental branch, or write direct.

BRANCHES

Baltimore, Md.	Dallas, Texas	Kansas City, Mo.	Philadelphia, Pa.
Boston, Mass.	Dayton, Ohio	Los Angeles, Cal.	Pittsburgh, Pa.
Buffalo, N. Y.	Detroit, Mich.	Lutz, Fla.	Rochester, N. Y.
Chicago, Ill.	Greensboro, N. C.	Memphis, Tenn.	St. Louis, Mo.
Cincinnati, Ohio	Hartford, Conn.	Milwaukee, Wis.	San Francisco, Cal.
Cleveland, Ohio	Indianapolis, Ind.	New York, N. Y.	Syracuse, N. Y.

★ *Continental also manufactures extruded and lathe cut goods, as well as a complete line of hose, packing and other industrial maintenance items.*

SEE OUR CATALOG IN SWEET'S

CONTINENTAL RUBBER WORKS
ERIE · PENNSYLVANIA · U. S. A.

(*Continued from page 226*)

the lost wax molding process, or the use of casting plastics may solve an intricate production problem. There are many kinds of heat treating operations, and at least four types of forging. The impregnation of wood with methylolurea makes pine as hard as maple, and maple as hard as lignum vitae. There are numerous new coating and finishing materials. Machine tools are being obsoleted. U. S. Steel announces a new stainless steel, which duly heat treated, has a tensile strength of 225,000 psi. There are battery operated welding units. Westinghouse announces the production of molybdenum in bulk lots, making it available for molding in any desirable shape, in lieu of the former practice of powdering and sintering.

Fiberglas is used in plastic formulations having a tensile strength of 75,000 psi — greater than many structural steels. There are numerous developments in Fiberglas fabrics and laminated materials of prime interest.

About the only things that do not reflect material improvement are wood office furniture and pay checks. New technological developments and product improvements are being announced daily. All these new developments mean that Dame Opportunity is knocking at your door. George Renard tells me that there is an unfillable demand for topnotch purchasing men. The demand will increase as men in purchasing prepare themselves for complete material control, purchasing for profit, and as management becomes more aware of the basic profit-making qualities inherent in procurement and scientific materials control.

You are on the ground floor. Your interest and your perseverance in progressive education will determine your status in the days to come. Quoting Thoreau, "Build your castles in the air, but put a firm foundation under them."

THE NAVY IN THE PACIFIC

Edward J. Devitt, assistant attorney general, state of Minnesota who until recently was a Naval Intelligence Officer, who served in the Pacific theatre of action and was wounded in the Phillipines, spoke on "The Navy in the Pacific" at the January 9th meeting of the Twin City Association of Purchasing Agents, held at the Minneapolis Athletic Club.

NEW YORK ASSOCIATION HOLDS NATIONAL NIGHT

"Purchasing Post War" was the subject of talk by President Charles L. Sheldon of the National Association of Purchasing Agents, at the "National Night" meeting of the Purchasing Agents Association of New York, at the Builders Exchange Club. Secretary George A. Renard of the National gave an interesting talk using his theme "From one P. A. to Another"; and Vice President Albert W. Zackey, Eighth District,

(*Continued on page 232*)

COLGATE

"ENGINEERED SERVICE," FACILITIES AND SKILL IN

Aluminum, Magnesium and Stainless Steel

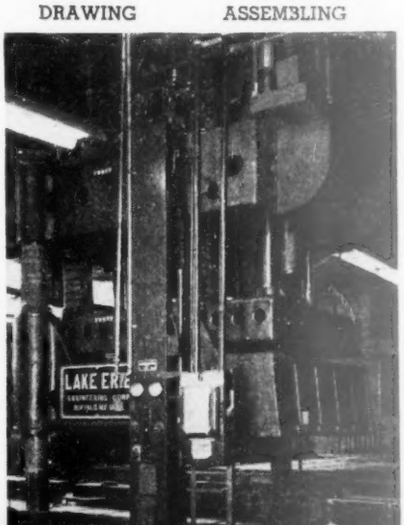
This precision fabricated assembly demonstrates COLGATE'S specialized "know-how," engineering ingenuity, and complete facilities for working with the light metals. Simple as it looks, the end use of this assembly necessitated the creation of positive tooling in order to attain the exact interchangeability required, as well as overcome the problems concerned with stamping, forming and welding operations — all of which were solved before mass production was started. This was accomplished by continuous "Engineered Service" conferences resulting in the saving of time, money and materials and the delivery of a quality product on time.

From the rough-idea stage to final assembly, COLGATE can help solve your problem of developing new products, improving old ones, substituting light metals for other materials. COLGATE can supply the "know-how" for special parts fabrication and assembly and in essence give you additional plant facilities without investment. COLGATE'S specialized experience, complete and centralized facilities, latest mass-production assembly techniques all contribute to meet your exacting specifications and delivery dates. Where blueprints are already prepared we will fabricate and assemble parts to your specifications.

Let COLGATE show you how these sales-creating product features — *light weight, increased strength, durability, added beauty and improved performance* can make light metals a desirable substitute for heavier materials. Learn how COLGATE'S "Engineered Service", facilities and skills can help make your product faster, better, more economically. Your inquiry is invited, prompt attention and complete confidence assured.

COLGATE has a variety of hydraulic presses ranging from 10 to 750 ton capacity and mechanical presses from 2½ to 200 tons capacity. Complete and centralized facilities for—

STAMPING	WELDING
FORMING	FINISHING
DRAWING	ASSEMBLING



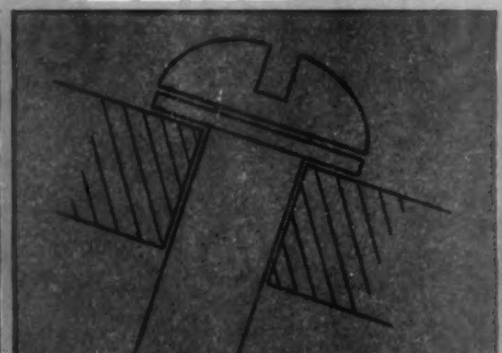
COLGATE

SEMS
IS YOUR ANSWER!

SEMS ARE PRE-ASSEMBLED WASHER AND SCREW UNITS IN WHICH THE WASHER IS HELD ON THE SCREW BY THE ROLLED THREAD AND IS FREE TO ROTATE. (SEE ILLUSTRATIONS BELOW)

HOW SEMS ARE MADE

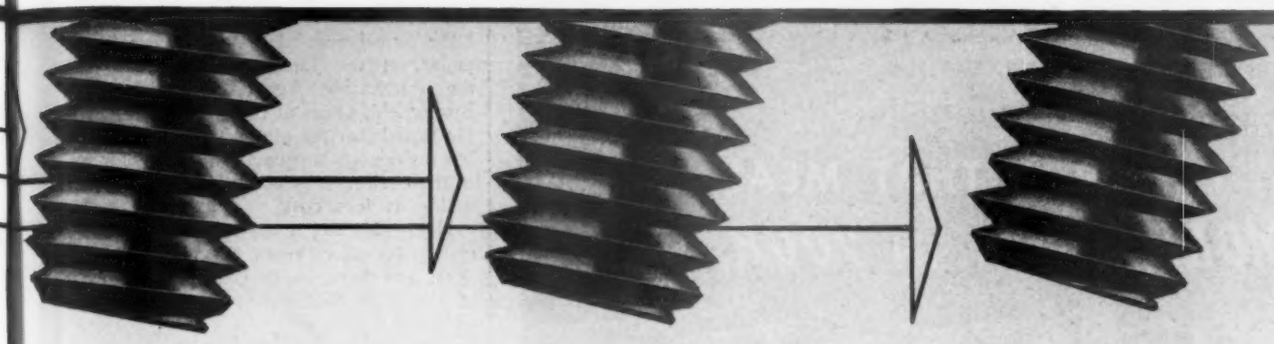
The washer is specially designed to fit closely on the screw blank.



The washer is placed on the screw blank by machine and then the thread is rolled.

The rolled thread holds the washer on the screw but allows it to rotate.

PRE-ASSEMBLED TO REDUCE YOUR COSTS!



THE USE OF SEMS ELIMINATES TIME-WASTING HAND ASSEMBLY OF WASHERS AND SCREWS . . . ONLY ONE UNIT TO HANDLE . . . FASTER, EASIER TO DRIVE . . . ASSURES BETTER FASTENINGS AND IMPROVED PRODUCT PERFORMANCE.

SEMS ARE AVAILABLE FROM THE FOLLOWING FASTENING MANUFACTURERS:

American Screw Co.
Providence, R. I.

Central Screw Co.
Chicago, Ill.

Chandler Products Corp.
Cleveland, O.

Continental Screw Co.
New Bedford, Mass.

The Corbin Screw Corp.
New Britain, Conn.

Eaton Mfg. Co.
Reliance Spring Washer Div.
Massillon, O.

The Lamson & Sessions Co.
Cleveland, O.

Manufacturers Screw Products
Chicago, Ill.

National Lock Co.
Rockford, Ill.

The National Screw & Mfg. Co.
Cleveland, O.

New England Screw Co.
Keene, N. H.

Pheoll Manufacturing Co.
Chicago, Ill.

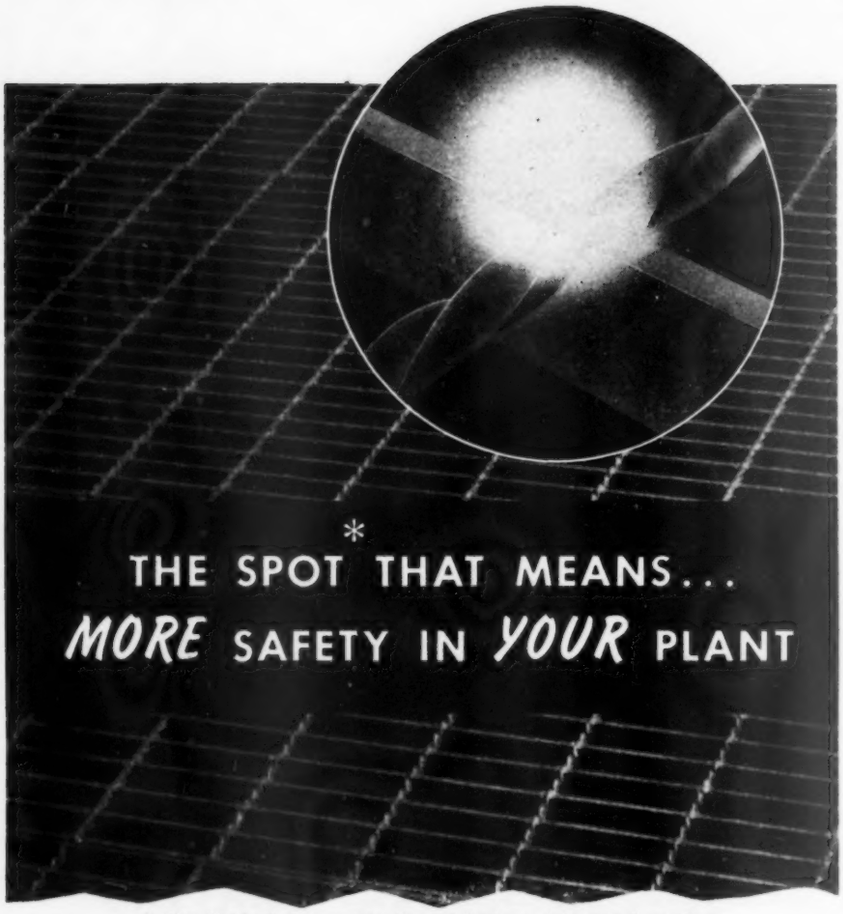
Progressive Manufacturing Co.
Torrington, Conn.

Russell, Burdsall & Ward Bolt & Nut Co.
Port Chester, N. Y.

Scovill Manufacturing Co.
Waterbury, Conn.

Shakeproof Inc.
Chicago. Ill.

Steel Co., of Canada, Ltd.
Hamilton, Ont., Canada



* The illustration expresses the application of heat and pressure used to forge crossbars and bearing bars into one integral unit.

There's a big difference between ordinary grating and Blaw-Knox steel grating safety. For Blaw-Knox is the *only* grating with the electroforged *twisted bar.*

In factories, on cat-walks—see to it that skid-breeding floors are made skid-proof in any weather. Specify Blaw-Knox steel gratings, the only gratings with built-in twisted-bar safety factor.

...AND HERE ARE 5 REASONS WHY

1. SELF-CLEANING, no sharp corners to clog.
2. MAXIMUM OPEN AREA for light and air.
3. EASY TO MAINTAIN . . . paint reaches entire surface.
4. STRONG electroforged construction for easy erection.
5. SAFE footing at all times with twisted cross bar.

When further improvement in open-steel floors is called for by changes in business practice—Blaw-Knox will lead as always.

Blaw-Knox Catalog No. 1887 gives complete details on Blaw-Knox Electro-forged Steel Grating. Send for it.

DIVISION OF BLAW-KNOX COMPANY
2075 Farmers Bank Building, Pittsburgh 22, Pa.

Seven Blaw-Knox plants have been awarded the Army-Navy "E", and have regularly received renewal stars for continued high achievement in the production of war material.

BLAW-KNOX GRATING

(*Continued from page* 228)

talked on "Personality, An Important Cog in Purchasing." The dinner meeting was preceded by a forum discussion of "Container Procurement" by Edgar E. Rumple, Purchasing Agent, Containers and Supplies, Merck & Co., Inc., Rahway, N. J. Secretary J. H. Leonard announced that 11 new membership applications were being processed.

LATHE MOLD-MAKING UNIT SPRINGFIELD MEETING

Paul Montanus of the Springfield, Ohio, Machine Tool Co., discussed a new lathe attachment designed for making molds, at the January 9th meeting of the Purchasing Agents Association of Springfield, Ohio, at the Shawnee Hotel. He stated that the glass molding industry has evidenced a great deal of interest in the device. It is said to produce better molds at less cost.

Harry Martin, a member of the association for many years, and a past president, has been made General Manager of the Ross Willoughby company.

WHAT'S NEW IN PURCHASING CLEVELAND

Editor Stuart F. Heinritz of *Purchasing* Magazine was the principal speaker at "Past Presidents' Night" meeting of the Purchasing Agents Association of Cleveland, at the Cleveland Hotel January 24th. He spoke on the subject "What's New in Purchasing." Twenty-one of the twenty-three living past presidents were present, one of whom was S. Holmes Mansfield first president of the association who is still active in purchasing. The past presidents were presented with handsomely engraved placques in recognition of their activities and leadership throughout the history of the association. More than 175 members and guests attended the meeting.

EDITOR HEINRITZ ADDRESSES QUALITY CONTROL ENGINEERS

"Quality Control—Key to Value," was the subject of address by Stuart F. Heinritz, editor of *Purchasing* Magazine, at meeting of the Rochester Chapter of the Society of Quality Control Engineers held in the Chamber of Commerce, Rochester, N. Y., January 15th. Several members of the Purchasing Agents Association of Rochester, and the Rochester Association of Industrial Buyers (junior purchasing group) attended the meeting.

QUALITY CONTROL PITTSBURGH MEETING

Dr. M. A. Brumbaugh of the University of Buffalo was guest speaker at the January 15 meeting of the Purchasing Agents Association of Pittsburgh, at the Hotel William Penn. His subject was "Quality Control."

IF IT'S TO BE . . .

Extruded like this windshield wiper blade

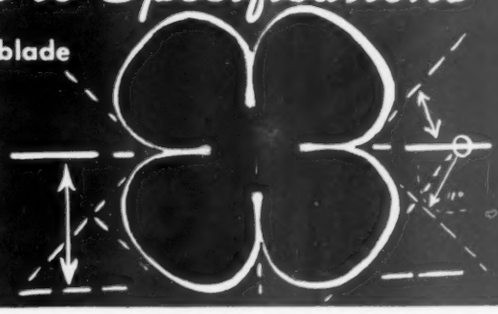
Die Cut like a motor housing

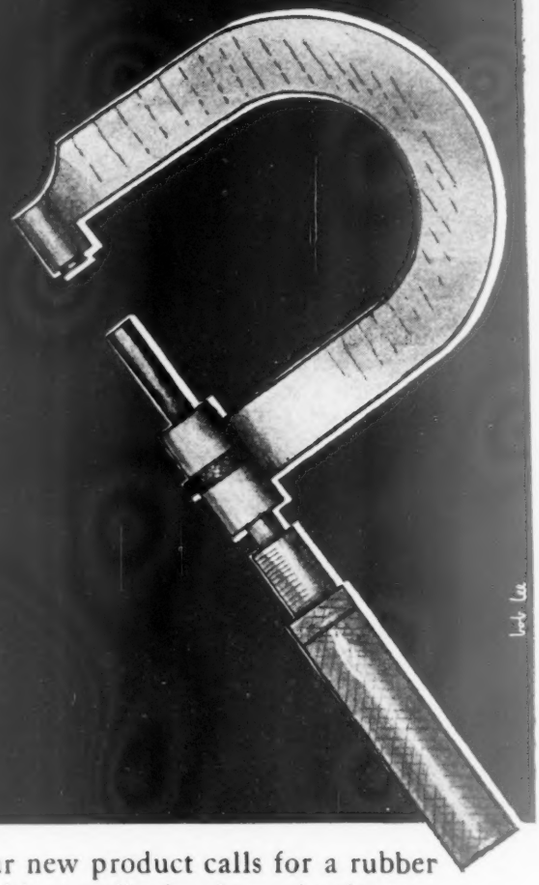
Made from Stock Molds

like a laboratory stopper

Molded to Specifications

like this fan blade





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it's H.O. *Canfield*"

If your new product calls for a rubber part—big, small, simple, or intricate—made to blueprint specification with micrometer accuracy—write or wire The H. O. Canfield Company!

FREE New H. O. Canfield General Catalog illustrates thousands of rubber and synthetic rubber parts manufactured for the aviation,

automotive, electrical, medical, plumbing, and general industries. Send for your copy today!

THE H.O. Canfield CO.

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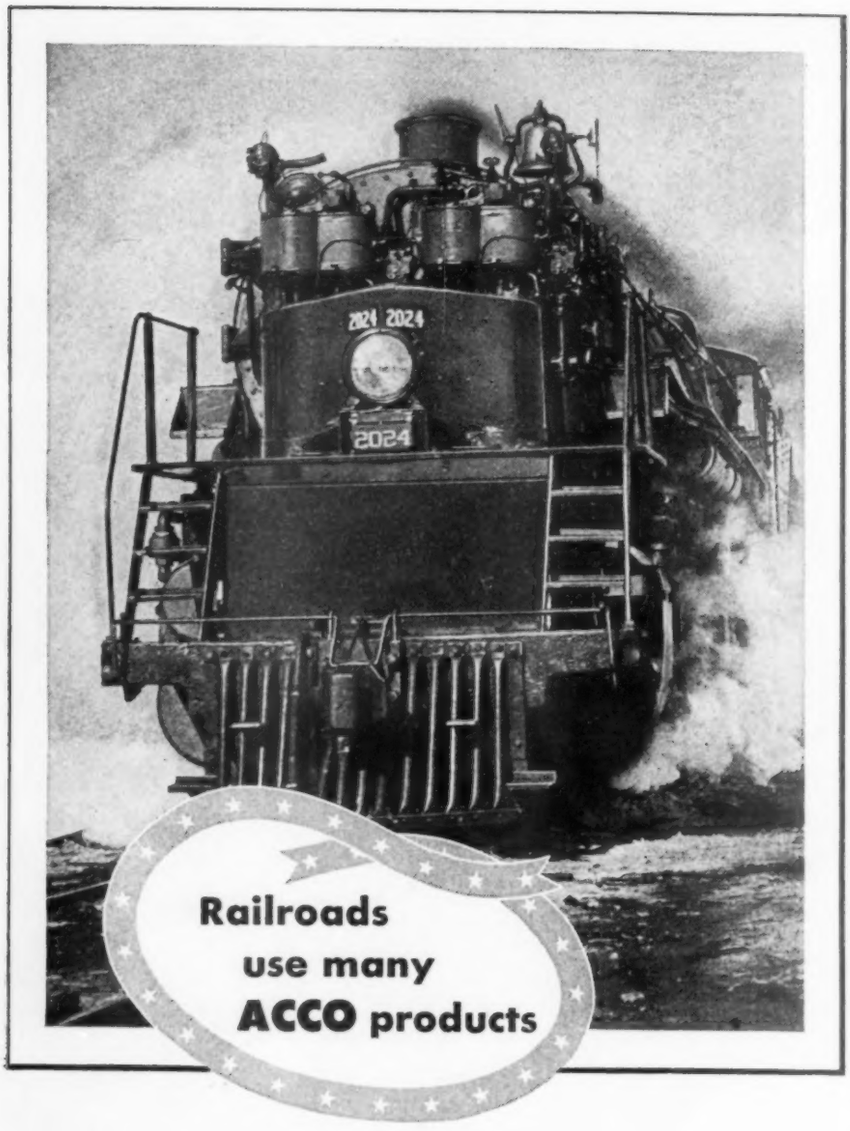


YOU SEE American Chain & Cable Company products in all types of locomotives and cars. You find them on tracks and in safety devices along the line. You notice them in shops where equipment is serviced.

For example, railroads use valves made by the Reading-Pratt & Cady division. They require hoists made by the Wright division, as well as wire rope and slings made by the American Cable and Hazard divisions.

Chain made by the American Chain division is used for coupling, switching, braking, signaling, loading, lifting, holding . . . and many other jobs. Other ACCO products, including Reading Steel Castings, serve a variety of railroad needs.

These are only a few of the primary products made by the 15 divisions of ACCO: Chain • Wire Rope • Aircraft Cable • Fence • Welding Wire • Cutting Machines • Castings • Wire • Springs • Lawn Mowers • Bolts & Nuts • Hardness Testers • Hoists & Cranes • Valves

ACCO

BUY VICTORY BONDS

AMERICAN CHAIN & CABLE • BRIDGEPORT CONNECTICUT

TODAY'S PURCHASING PROBLEMS CONNECTICUT ASSOCIATION

Stuart F. Heinritz, editor of Purchasing Magazine, spoke on "Today's Purchasing Problems" at the January meeting of the Purchasing Agents Association of Connecticut, held at the New Haven Lawn Club, New Haven, Conn., on the 22nd. A feature of the meeting was the installation of new officers for 1946 by Past President Fred G. Space.

The first session of the association's class on purchasing, under direction of the Educational Committee, Tony Towle of the Wallace Barnes Co., chairman, was held prior to the meeting. Leaders of this meeting were Wm. J. Roemer, purchasing agent for the Bristol Co., Waterbury, Conn., president of the association, and G. T. Zahnke of the Wallace Barnes Company of Bristol.

PROGRESSIVE EDUCATION — METROPOLITAN ASSISTANTS CLUB

"Progressive Education" and "New Developments in the Purchasing Field" was the subject of discussion by George Henry, associate editor, *Purchasing* Magazine, at the January 8th meeting of the Metropolitan Purchasers' Assistants Club, held in Midston House, New York. An abstract of the talk appears in the association section of this issue of *Purchasing*.

George McShane vice president of the association was recently appointed Purchasing Agent of the American Felt Company, Glennville, Conn.

OREGON ASSOCIATION TO BE COUNCIL MEETING HOST

The Purchasing Agents Association of Oregon, Portland, Ore., will be host to members of the District Council on March 18th, the date coinciding with the association's monthly dinner meeting.

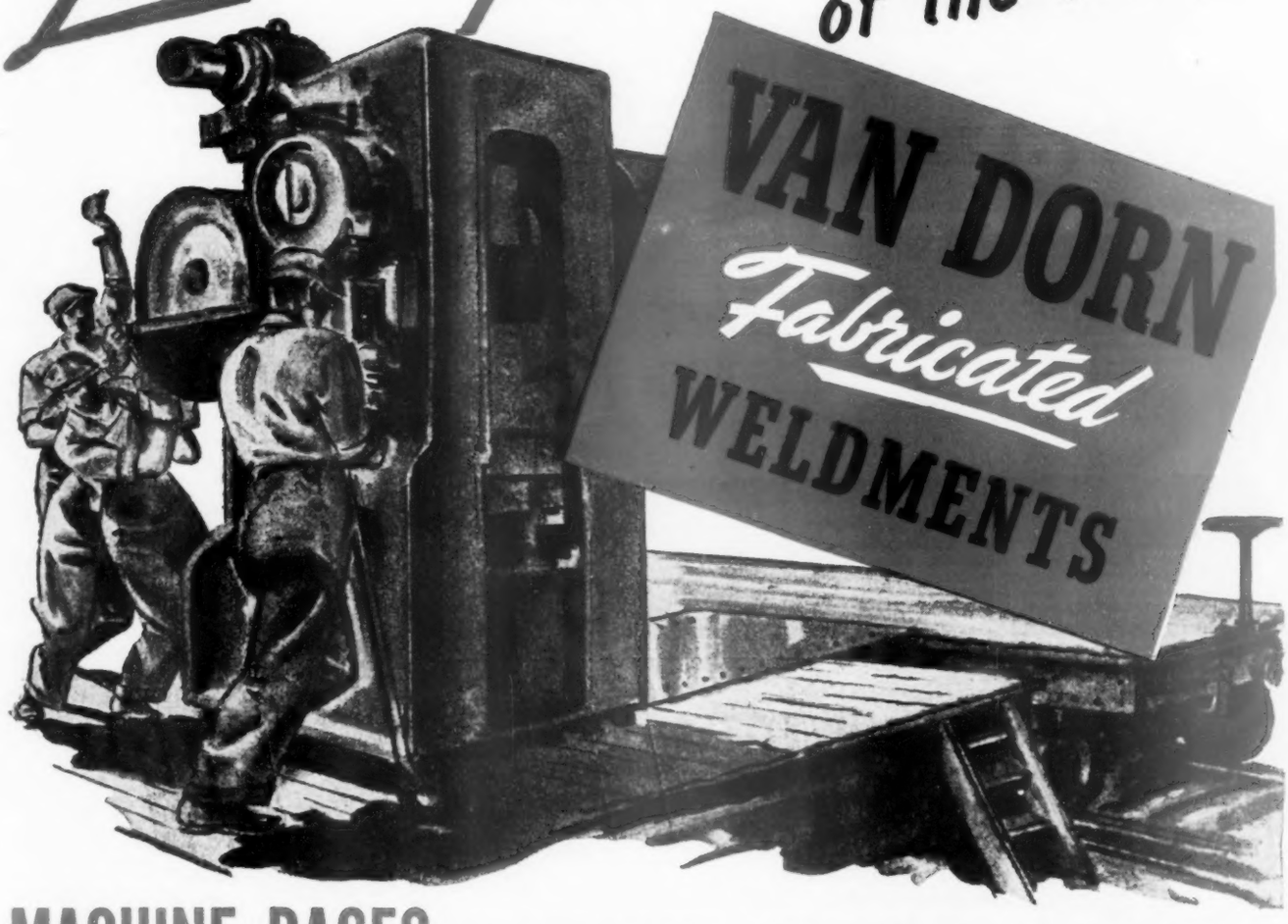
Guest speaker at the association's December 4th meeting was Robert Upson of the Shell Oil Co., who appeared in his capacity as chairman of the Portland Junior Chamber of Commerce's off-street parking committee. Among the plans discussed was the proposed construction of a $2,000,000 underground parking area which would accommodate 1500 cars—sufficient to park the total of cars parked in 60 city blocks.

EXECUTIVE NIGHT MEETING ST. LOUIS

C. Hamilton Moses, president, Arkansas Power & Light Co., Little Rock, Ark., was guest speaker at the Executive Night meeting of the Purchasing Agents Association of St. Louis, at the Coronado Hotel January 15th. Other leaders participating in the program were Chester Davis president, Federal Reserve Bank of St. Louis, and J. W. McAfee,

(*Continued on page* 236)

Less Weight... but that's only part of the story!



MACHINE BASES OF STRONGER, SMOOTHER CONSTRUCTION —BETTER DESIGN, MORE MODERN APPEARANCE

Welded structures, designed and built by Van Dorn, offer ruggedness, adaptability, weight saving, economy, modern design. Van Dorn has complete fabricating and manufacturing facilities . . . experienced design engineers . . . specially trained workmen . . . ready to meet your requirements. Your inquiry will receive prompt, careful attention.

Builders of better iron and steel products for 75 years.

THE VAN DORN IRON WORKS CO.
2685 EAST 79TH STREET CLEVELAND 4, OHIO

authoritative

complete

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LATEST H-VW-M PLATING BULLETIN

COMPLETE details on three highly successful Cobalt-Nickel plating processes are now available to you without charge in a 12-page bulletin just issued by the Hanson-Van Winkle-Munning Company. The new bulletin, "Technical Instructions for Cobalt-Nickel Plating Processes," describes efficient and economical production of smooth and bright alloy deposits which are white to blue-white in color, hard yet relatively ductile, and exceptionally high in protective value.

The respective advantages of Type 9H Process (1% Cobalt), Type 5 (5% Cobalt), and Type AA (18% Cobalt) are shown in detail, together with full preparation, operation and maintenance information. Listed and illustrated are many products on which these processes have been used, such as household appliances, automobile bumpers and trim, plumbing fixtures, tools, toys and metal furniture.

"Technical Instructions for Cobalt-Nickel Plating Processes" may show *you* new possibilities for *your* products. It may be the key to the solution of your particular plating and finishing problem. Write for it today, without obligation.

723

HANSON-VAN WINKLE-MUNNING CO.
MATAWAN, NEW JERSEY
Manufacturers of a complete line of electroplating and polishing equipment and supplies
Plants: Matawan, New Jersey · Anderson, Indiana
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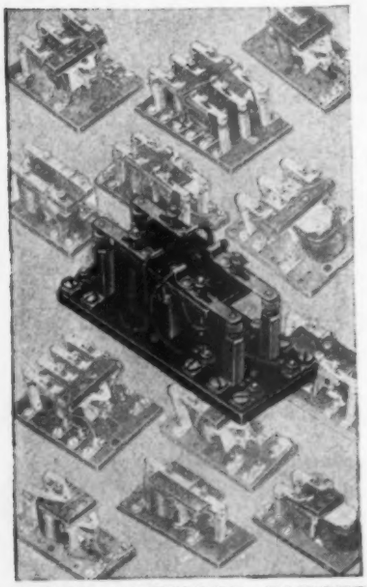
SINCE 1920

A NEW IDEA



BULLETIN 130 RELAYS

The Bulletin 130 relays offer the user the choice of one to four poles, 6 to 230 volts D. C. and 6 to 440 volts A. C. in single or double throw, normally open or closed, with or without blowout coils and a host of other options. With such flexibility of arrangement, custom requirements can be met without prohibitive cost or undue delay in delivery.

Send for Bulletin No. 130 giving full particulars of this line of Relays. In it you will find relays that exactly meet your requirements.

WARD LEONARD
RELAYS • RESISTORS • RHEOSTATS
Electric control devices since 1892

WARD LEONARD ELECTRIC CO., 50 SOUTH ST., MOUNT VERNON, N. Y.
OFFICES IN PRINCIPAL CITIES

(*Continued from page* 234)

president, Union Electric Company of Missouri. The meeting was featured by large attendance of executives of members' firms.

BALTIMORE ASSOCIATION HOLDS LADIES NIGHT

The regular monthly meeting of the Purchasing Agents Association of Baltimore held at the Lord Baltimore Hotel on January 16, was featured by a general round table discussion. On Saturday, February 23rd, the association will hold its Twenty-Sixth Annual Ladies Night at the Lord Baltimore, which will be featured by dinner, floor show and dance.

NEW FIELD FOR OIL COMPANY BUYERS — TULSA

C. O. Wilson, editor, *Oil & Gas Journal,* Tulsa, Okla., who recently completed an extended tour of the Middle East oil fields and participated in the London Oil conference, spoke on "A New Field for Oil Company Buyers — The Middle East" at the January 8th meeting of the Purchasing Agents Association of Tulsa, Okla., at the Chamber of Commerce, Tulsa. Also, Ruth Sheldon Knowles, writer and speaker who glamorized the "Rover Boys" spoke on "A Rover Girl Visits Tulsa."

President Charles Sheldon of the National Association, and O. D. Story, vice president, District No. 2, were guest speakers at the association's January 25th meeting.

PAST PRESIDENT'S NIGHT MILWAUKEE

The January 8th meeting of the Purchasing Agents Association of Milwaukee was dedicated to the past presidents and honorary members of the association, for which a special program had been arranged with James M. Hamilton of the Dumore Co., Racine, Wis., as toastmaster. The Milwaukee association reports two additional active members, F. K. Bloomquist, the Louis Allis Co., Milwaukee, and Eugene J. Sperry, Milwaukee Metal Spinning Co.; and one non-resident member, E. R. Sutherland, Thilmany Pulp & Paper Co., Kaukauna, Wis.

LENORE WARTES HEADS SEATTLE WOMEN'S GROUP

LeNore Wartes, purchasing agent for the Ketchikan Spruce Mills, Seattle, Wash., is the new president of the Women's Group of the Purchasing Agents Association of Washington, succeeding Edith Johnson. Other new officers are, Lucille Graham, purchasing agent for the Bon Marche, vice president; Gladys Treisch, purchasing agent for Pascal Company, treasurer; and,

(*Continued on page* 238)

4 FUNDAMENTALS

GIVE THESE CUTTERS THEIR SUPERIORITY

1 CORRECT DESIGN
2 SELECTED MATERIALS
3 ACCURATE MANUFACTURE
4 SCIENTIFIC HEAT TREATMENT

Use Brown & Sharpe Cutters to Maintain Your Production Schedule

STYLES AND SIZES FOR MOST REQUIREMENTS

Catalog on Request

B·S BROWN & SHARPE MFG. CO.
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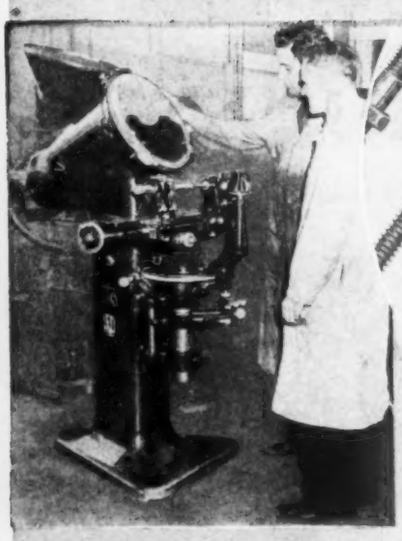
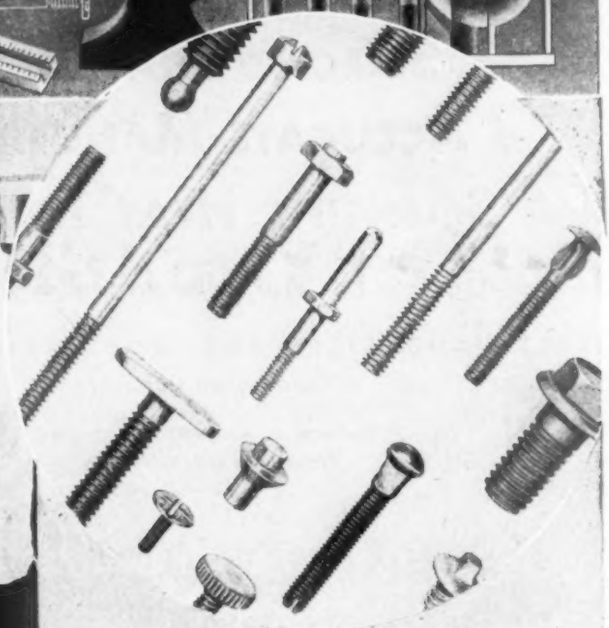
. . . We urge buying through the Distributor

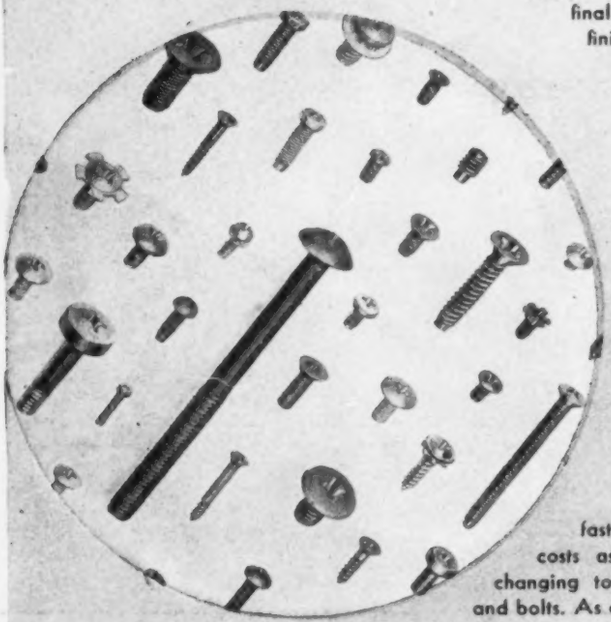
BROWN & SHARPE CUTTERS



Modern comparaters supplement micrometers, gages and other inspection devices to insure uniform precision of HOLTITE Engineered fastenings throughout production.



"Engineered Fastenings" is not a catch-phrase! It is a brief, obvious designation of the scientific production of HOLTITE screws, bolts and allied fastenings. A technical engineering staff directly supervises every operation, from the analysis of raw material, through our own steel processing mill and wire drawing departments, through each separate stage of manufacture to the final hardening, heat-treating and finishing operations. With modern chemical and metallurgical laboratories and special testing equipment, our engineers have every scientific aid to control the precision production of standard and Special HOLTITE fastenings.



Cut your fastening time and costs as much as 50% by changing to HOLTITE-Phillips screws and bolts. As driver or bit does not slip from tapered recess, power drivers can be used safely, even on finished parts, to speed production and lower costs. Screws set up tighter to resist vibration and strengthen assembly. Specify HOLTITE-Phillips on next order.

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.

(*Continued from* page 236)

Eileen Mitchell, purchasing agent for the Savage Metals Company, secretary. Installation of new officers was at the January meeting.

PACIFIC NORTHWEST P. A. CONFERENCE SET FOR APRIL

The 10th Annual Pacific Northwest Purchasing Agents Conference will be held at the Olympic Hotel, Seattle, Wash., April 27th and 28th. Plans are under way for a worthwhile gathering of British Columbia, Oregon and Washington Purchasing Agents.

PROBLEMS & PRACTICES SAGINAW VALLEY

"Purchasing Problems and Practices" was the subject of talk by R. P. Keller, management enginner, at the January 8th meeting of the Saginaw Valley Purchasing Agents Association, at the Bancroft Hotel, Saginaw, Mich. Secretary Coultrip reports that 54% of the membership and five guests were present.

PHILADELPHIA ASSOCIATION IN NEW QUARTERS

Executive offices of the Purchasing Agents Association of Philadelphia, and its official publication, the Philadelphia Purchaser, are now located on the 15th floor of the Inquirer Tower, 400 No. Broad Street, Philadelphia 30, Pa. The association's roster now shows 446 members.

PAST PRESIDENTS' NIGHT EASTERN NEW YORK

The Purchasing Agents Association of Eastern New York, dedicated its January meeting held on the 17th at Wolfert's Roost, Albany, as Past Presidents' Night. The meeting was featured by a lively discussion on commodities.

ANNUAL SALESMEN'S NIGHT MONTREAL

The Purchasing Agents Association of Montreal held what it terms one of its most important meetings, Salesmen's Night, January 15th at the Mount Royal Hotel. Guest speaker for the occasion was A. D. Dunton, chairman of the Canadian Broadcasting Corporation, who spoke on "Purchasing and Selling Intangibles." A Salesmen's variety show was held under the direction of Don Stuart.

BOOKLET ON CARE OF GRINDING WHEELS

Ten-page pocket-size folder on the care of grinding wheels in the industrial plant has been published by The Sterling

(*Continued on page* 240)

How To Buy
PRATT & WHITNEY MACHINES
from U. S. Government Surplus Stock

We are glad to offer our help and experience to prospective buyers of Pratt & Whitney machines that are offered for sale as surplus equipment. If you are interested in acquiring a government surplus Pratt & Whitney machine tool, go to the nearest P&W Branch Office and make your wants known. We will work with you and the RFC Office to find the machine that suits your requirements. We will give you the specifications and literature covering our *standard model* of that particular type.

To all prospective buyers of P&W machines we wish to offer a word of advice. Included in government surplus stock are many *special* P&W machines . . . standard models that have been either specially tooled, or adapted to a particular job, or modified for special purposes. Such machines are *not usable for general work* until they have been reconverted to standard.

We are anxious to see that every future owner of a Pratt & Whitney machine tool bought from government surplus is getting fully satisfactory results from his purchase. For complete details contact our nearest Branch Office as listed below and talk to our engineers.

Branch Offices and Agencies: Birmingham Boston Chicago Cincinnati Cleveland Detroit Los Angeles New York Philadelphia Pittsburgh Rochester San Francisco St. Louis

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DIVISION NILES-BEMENT-POND COMPANY

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Accuracy

REPAIRS SPEEDED
DOWNTIME REDUCED
COSTS CUT . . .

by LUNKENHEIMER
Interchangeable Parts

IRON BODY
150 lb. S. P.
"FERRENEWO"

BRONZE
200 lb. S. P.
"RENEWO"

In servicing the Bronze "Renewo" and Iron Body "Ferrenewo" Valves—both regular and plug types—only *one stock of parts* is required. *All* parts (except bodies and bonnet rings) are made exactly the same and fit each other perfectly.

Repairs are more quickly and easily made, ordering and handling are simplified. The result: Lower maintenance cost and low ultimate valve cost.

Lunkenheimer part-interchangeability is fully illustrated and described in Circular No. 567.

Ask your Lunkenheimer Distributor for a copy, or write direct.

Fig. 16
300 lb. S. P.
Bronze "RENEWO"

Fig. 16-P
300 lb. S. P.
Bronze Plug Type
"RENEWO"

VALVE MAINTENANCE SIMPLIFIED!

All parts of these valves (except bodies and bonnet rings) are exactly the same. They fit each other perfectly.

For example—if you need a stem, disc, or seat ring for the "RENEWO", you can use the corresponding part of the "FERRENEWO", and vice versa.

Thus there are fewer parts to be carried, repairs are more quickly and easily made. The labor, time, and expense of valve maintenance is cut down—'way down!

SAVE THIS WAY, TOO!

For severe throttling service, a regular type can be converted into a plug type, by simply changing the seat and disc, without taking the valve out of the line.

Thus it's not necessary to buy a whole new valve—just a matched set of plug type seat and disc which interchange perfectly in corresponding patterns and sizes in a range of pressures from 150 to 350 lb. S. P.

Lunkenheimer simplicity of design, minimum number of parts, and fine precision workmanship make this and other outstanding economies possible.

SEE YOUR LUNKENHEIMER DISTRIBUTOR!

Lunkenheimer Distributors are located in all industrial centers. There is one near you—have him demonstrate with actual samples the interchangeability of parts in "RENEWO" and "FERRENEWO" Valves. It's a big time and money saver for any plant!

THE LUNKENHEIMER CO., Cincinnati 14, Ohio
(OFFICES: NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 7.
EXPORT DEPARTMENT: 318-322 HUDSON ST., NEW YORK 13, N. Y.)

(*Continued from page* 238)

Grinding Wheel Division of the Cleveland Quarries Company, Tiffin, Ohio. The company states that various tests conducted by grinding wheel manufacturers have indicated that the greater percentage of breakages of grinding wheels occurs in manufacturing plants through negligence or lack of knowledge on the part of workers. The folder is available in quantities for plant distribution.

TESTIMONIAL PRESENTED TO DR. LYMAN J. BRIGGS

A luncheon in honor of Dr. Lyman J. Briggs, Director Emeritus of the National Bureau of Standards, was held by the Federal Specifications Board on December 11 at the Washington Hotel, Washington, D. C., at which Clifton E. Mack, Director of the Procurement Division of the Treasury Department, presented Dr. Briggs with a testimonial resolution passed by the Board thanking its former chairman for his "exceptional services and . . . the high inspiration and quality of his achievement and leadership" in the field of Federal Standardization. The testimonial is as follows:

Dr. Lyman J. Briggs, Director Emeritus, National Bureau of Standards, is presented with testimonial resolution by Clifton E. Mack, Director of Procurement, Treasury Department.

"Whereas Dr. Lyman J. Briggs, Director Emeritus of the National Bureau of Standards, through his leadership and invaluable scientific and technical knowledge, has made an outstanding contribution to the field of Federal Standardization during his forty-nine years of Government service; and

"Whereas, as Director of the National Bureau of Standards for twelve years, he has marshalled the tremendous technical skill of his Bureau to aid the Federal Standards program; and

"Whereas, since 1932 he has served as Chairman of the Federal Specifications Board and the Federal Specification Executive Committee and more recently of the present Federal Specifications Board respectively;

"Be it therefore resolved that the members of the Federal Specifications Board desire to express to him their utmost appreciation for his exceptional services and make formal and permanent recognition of the high inspiration and quality of his achievements and leadership."

The testimonial was signed by Willis S. MacLeod, executive vice chairman of

(*Continued on page* 242)

OLD MAN COMPETITION IS GETTING READY

Let Roebling strip steel help keep your costs down!

TO MEET COMPETITION, those glittering new products will depend for success on their ability to be produced with maximum uniformity of specifications. Net result—fewer rejections, costs kept down!

Roebling craftsmen are past masters in matching manufacturers' specifications. If *your* new product is made from Roebling strip steel, round, flat or shaped wire—it's off to the right start, production-wise and cost-wise. Because in temper and finish, in steel analysis and dimensional uniformity, Roebling material is *right* and ready for your machines.

Roebling equipment and facilities are up-to-date, complete, *unexcelled*. Skilled workmen are schooled in thorough-going Roebling methods developed in a century's experience with wire. This combination, with the help of Roebling engineers, can be turned into low-cost production for you. As a first step in meeting competition, why not call at our nearest branch office?

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

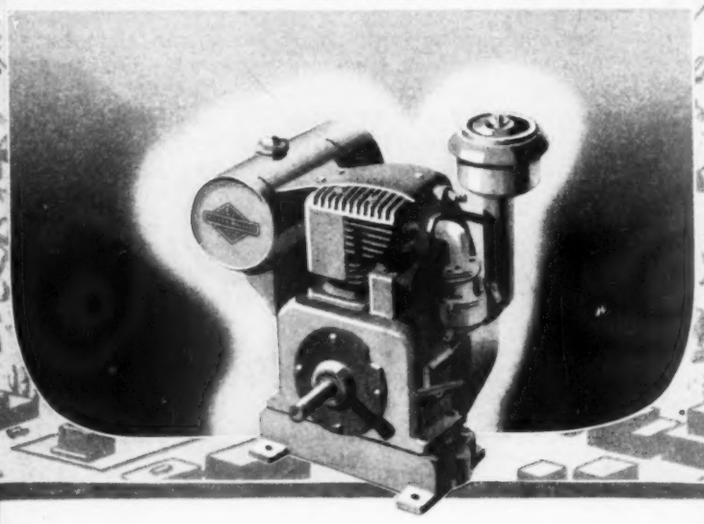
Wire Rope and Strand • Fittings • Slings • Cold Rolled Strip • Round and Shaped Wire • Aircord, Swaged Terminals and Assemblies • Wire Cloth and Netting • Suspension Bridges and Cables • Aerial Wire Rope Systems • High and Low Carbon Acid and Basic Open Hearth Steels • Electrical Wires and Cables

ROEBLING

PACEMAKER IN WIRE PRODUCTS

BRIGGS & STRATTON ENGINES

THE "RIGHT" POWER FOR YOUR EQUIPMENT



Manufacturers, dealers and users of gasoline powered appliances, farm machinery and industrial equipment know from experience that it pays to power with Briggs & Stratton 4-cycle, air-cooled engines. Over two and one quarter million of these engines have demonstrated their ability to deliver dependable power under all operating conditions. Specify Briggs & Stratton engines and you are assured of the "right power" for your equipment.

BRIGGS & STRATTON CORPORATION
MILWAUKEE 1, WISCONSIN, U.S.A.

Air-Cooled Power

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

(*Continued from page 240*)

the Federal Specifications Board, Director of Procurement Clifton E. Mack, and others.

Norman F. Harriman, former technical consultant of the board is also being presented with a testimonial resolution. He retired October last.

New Chairman

Dr. Edward U. Condon, Director of the National Bureau of Standards, has been appointed Chairman of the Federal Specifications Board, succeeding Dr. Briggs. Samuel P. Kaidanovsky, acting chief of the Research and Technical Services Division, Standards Branch, Procurement Division, succeeds Mr. Harriman as Technical Consultant.

The Federal Specifications Board was established by the Director of Procurement last August and is composed of representatives of ten Government agencies. In conjunction with the Standards Branch of the Procurement Division, it is responsible for the preparation of purchase specifications for supplies used by the Federal Government.

ABRASIVE COMPANY CHANGES NAME AND TRADEMARK

Illustration shows master trademark officially adopted by the Simonds Abrasive Company—new corporate name of the Abrasive Company, Philadelphia, Pa. The Abrasive Company was founded in 1892 and has been a manufacturer of

SIMONDS ABRASIVE CO. PHILADELPHIA, PA. MADE IN U.S.A.

grinding wheels and other abrasive products for over half a century. In 1927 the company was purchased by Simonds Saw & Steel Company of Fitchburg, Mass., at which time it became a division of the Simonds organization. The new trademark will identify all products of Simonds Abrasive Company as well as those manufactured by all branches of the Simonds Saw & Steel Company. There is no change in ownership, management or policy.

MOVIE EXPLAINS TELEVISION

"Sightseeing at Home", 16mm sound film, 1¼ reels, 15 minutes, is the title of film produced in the studios of General Electric Company, which presents the story of development and operation of television.

The subject is summarized by a backstage glimpse of what goes on during the televising of an operetta, showing how the sound and pictures are picked up from the set, and the final selection of the picture to be sent over the air.

Prints of the film may be secured, free of charge, by writing to the Y.M.C.A. Motion Picture Bureau, 347 Madison Ave., New York 17, N. Y.

BWH
DEPENDABLE RUGGEDNESS

112 TONS OF CRUSHED GLASS DAILY?

EASY WITH A TOUGH BWH BELT

PROBLEM: To haul 112 tons of crushed glass each 14-hour day — 365 days a year, and through drastic temperature changes.
SOLUTION: BWH "Bulldog" Belting, of course!

This rugged conveyor belting is made by the famous ROTOCURE process of continuous vulcanization that insures stamina and ease of operation, regardless of how abrasive the load. This BWH belt has run continuously since July 7, 1942, and . . . at a lower maintenance cost.

Through 65 years of leadership in the industry — BWH has pioneered the development of tough conveyor belts and other rugged products of dependability. Look to BWH for the solution to your tough problem!

HAVE YOU A JOB WHERE STAMINA COUNTS?
Bring us your toughest problems . . . we're specialists in solving them. Consult your nearest BWH distributor, or write to BWH direct.

BOSTON WOVEN HOSE & RUBBER COMPANY
Distributors in All Principal Cities
WORKS: CAMBRIDGE, MASS.. U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

Better Envelopes.....

TRADE MARK REGISTERED

FOR EVERY BUSINESS USE

With five modern, efficient factories and more than 60 years of experience, TENSION KNOWS HOW to make better envelopes for every business use. Papers from the best mills in the country—the most modern envelope making equipment, and skilled craftsmen assure finest quality in Tension Envelopes. Discuss your mailing, filing or packaging problems with a Tension representative. Write or phone our nearest factory.

Including

- CORRESPONDENCE
- WINDOW
- POSTAGE SAVER
- CATALOG
- TENSION TIE
- METAL CLASP
- EXPANSION
- DUO-POST
- BOOKLET
- RETURN
- FLAT MAILING
- PACKAGING

Manufacturers Selling Direct to Users

TENSION ENVELOPE CORPORATION • NEW YORK 14, N. Y., 345 Hudson St. • *ST. LOUIS 3, MO., 23rd & Locust Sts.
*MINNEAPOLIS 15, MINN., 500 S. 5th ST. • *DES MOINES 14, IOWA, 1912 Grand Ave. • *KANSAS CITY 8, MO., 19th & Campbell Sts.
*Originally Berkowitz Envelope Co.

PRODUCTION EXECUTIVE

Office Equipment and Supplies

Monthly FORMS FORUM

Schedule Book for Control of Bulk Inventories;
Mimeographed Follow-up Forms, and
Purchase Order Form

Schedule Book

W. R. MURRAY, Purchasing Agent for Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., furnished the accompanying sheet from what is termed the "Schedule Book" for the control of bulk inventories; yarn inspection form; and purchase order form used by his company. The purchase order form is of interest because of its simplicity. Six copies are made—original and acknowledgment sheet for the vendor on white paper stock; Treasurer's copy, orange; Cost Department copy, blue; Receiving Department copy, orange; and Purchasing Department copy, yellow. The space occupied by "Important Instructions" and signature on the original, is left blank on the colored company copies, for recording information. Purchasing agents in other than textile fields may find the "Yarn Test" form of interest.

The Schedule Book

Explaining the use of the "Schedule Book", Mr. Murray writes: "A large bulk of our money is spent for relatively few raw materials—wool, cotton and jute yarns, fuel, dyestuffs and chemicals. The control of all the materials mentioned is

(*Continued on page 248*)

FORM 15178

PURCHASE ORDER

BIGELOW-SANFORD CARPET CO., Inc.

Order No. Ship to Date

THIS NUMBER MUST APPEAR ON ALL PACKAGES, INVOICES BILLS OF LADING, PACKING SLIPS AND CORRESPONDENCE

ALL CORRESPONDENCE ON THIS ORDER MUST BE ADDRESSED TO THE PURCHASING DEPT. AT

Class No.
Item No.

PLEASE FURNISH THE FOLLOWING MATERIAL SUBJECT TO INSTRUCTIONS BELOW

To Be Shipped Ship Via

Terms F. O. B.

QUANTITY	DESCRIPTION	PRICE

IMPORTANT INSTRUCTIONS

1. Acknowledgment Copy must be returned at once
2. Prices must not be increased without authorization from Purchasing Department
3. Changes in design or nature of these goods are not to be made unless authorized by the Purchasing Department.
4. Packages must contain a packing slip, specifying the exact contents and bearing our order number and your package number.
5. Invoices must be forwarded in duplicate by mail and not packed with the shipment. Each invoice must bear our order number and your package number. Separate invoices must be rendered for each shipment and sent to the same destination as the shipment.
6. Defective material, whether discovered at first external inspection or developing later in manufacturing processes, will be returned for full credit.

BIGELOW-SANFORD CARPET CO., Inc.

PURCHASING DEPT.

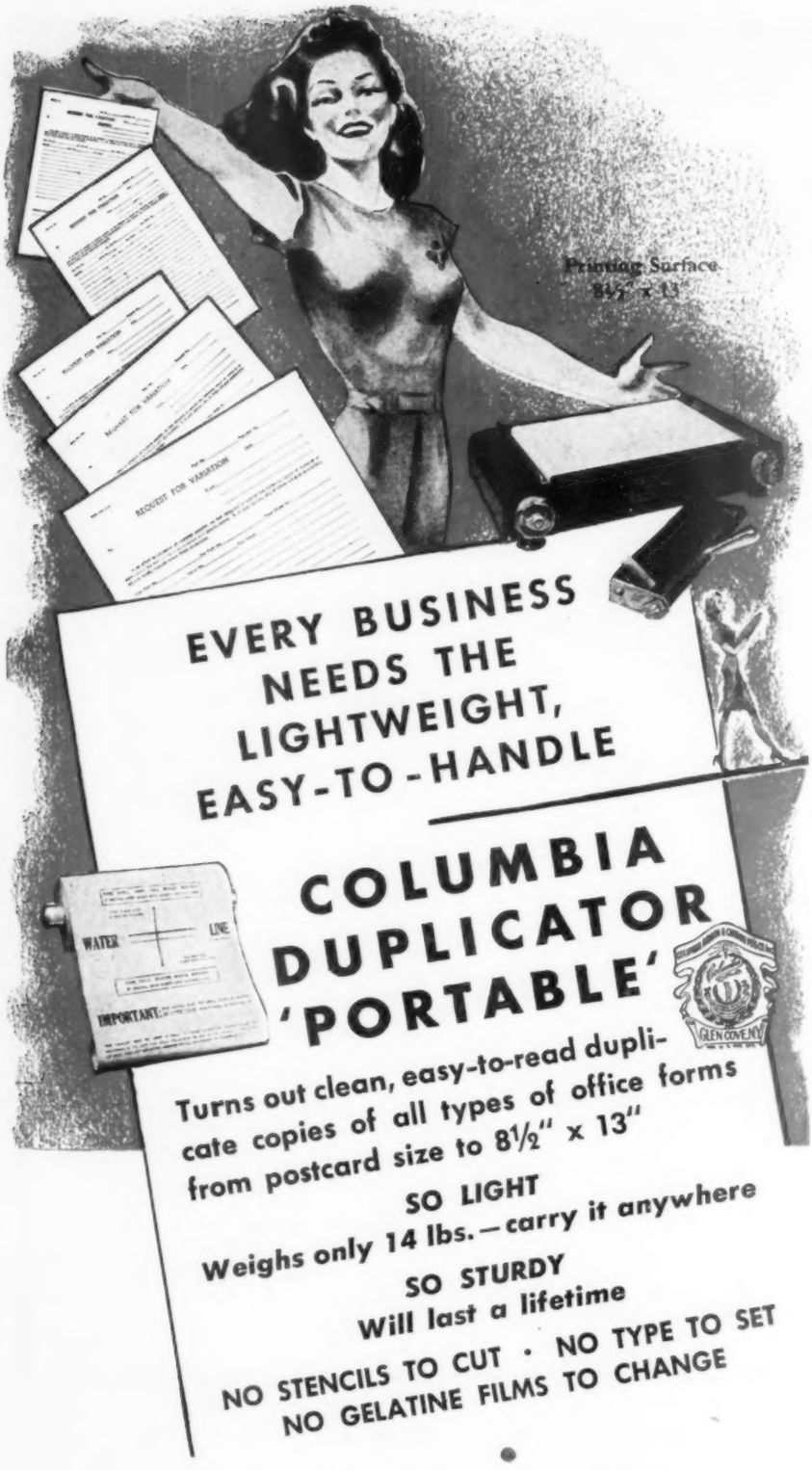
SCHEDULE SHEET

_____ MILL

MATERIAL SIZE COLOR

FORM 101

	DATE									STOCK					
		SCHEDULE	SHIPMENT	SCHEDULE	SHIPMENT	SCHEDULE	SHIPMENT	SCHEDULE	SHIPMENT	RECEIVED	USED	DISSECTION	QUOTA		ON HAND



COLUMBIA GELATINE ROLLS—*All Sizes* • *All Spindles*
FOR ALL HECTOGRAPH PROCESS DUPLICATORS

Patented "Water-line" feature keeps roll in all-season condition for finest duplicating results.

Ask your dealer or the Columbia office nearest you for demonstration, sample forms, full information and prices.

COLUMBIA RIBBON & CARBON MANUFACTURING CO., INC.

Main Office & Factory: **Glen Cove, L. I., N. Y.**

New York • Kansas City, Mo. • Chicago • Detroit • Milwaukee • Minneapolis Nashville • Philadelphia • Pittsburgh • Portland, Oregon • Cincinnati (Harris-Moers Co.) • Atlanta • *Also:* London, England • Sydney, Australia

RISING PAPER COMPANY DENIES RUMORS

Fred E. May, vice president of the Rising Paper Company, Housatonic, Mass., recently released the following letter:

"It probably is to be expected that in unsettled times, such as we are now going through, there are many rumors of changes in ownership and personnel of various organizations. Some of these are true, and many are without foundation.

"Two such rumors about the Rising Paper Company have recently come to our attention. One of these states that we are selling our mill to new owners, and the other is that we have completely eliminated our sales organization.

"We want to say that both of these rumors are without foundation, and that our policies are to be continued as in the past.

"Should these false statements come to your attention, we shall appreciate your assistance in stopping them."

ROCKWELL-BARNES APPOINTS MANAGER FOR OFFICE EQUIPMENT DIVISION

The Rockwell-Barnes Company of Chicago announces the appointment of Lieut. (jg) Leonard Rose, USNR as Manager of the Office Equipment Division.

Leonard Rose

In his new civilian capacity Mr. Rose looks back on exciting days that saw him win battle stars for such actions as Okinawa, Iwo Jima, Ulithi, Philippines and Tokyo. In his last Navy assignment as Communications Officer aboard the gallant aircraft carrier Yorktown, the famous "Fighting Lady", he was at sea off Tokyo while the "Fighting Lady's" aircraft provided vital covering when the momentous signing of Japan's surrender took place aboard the USS Missouri.

Prior to wearing Navy Blue and Gold he was six years with the National Blank Book Co. of Chicago. He is a graduate of Indiana University, home of the Big Ten's new football champions.

As manager of the company's Office Equipment Division, Mr. Rose will be in charge of Rock-A-File, the side-wise opening filing cabinets, card files and desks, its development in steel, and other new products soon to be announced to the trade.

(*Continued on page* 250)

Here's help in speeding up your paper work

Now, with* Mimeograph *duplication . . . Sounder, simpler methods of handling Purchasing, Receiving and Inspection—and Complete Production Control. Get full details in free folders.

Ready to come to your desk right now are two folders describing how Mimeograph* duplication handles these major business functions:

PURCHASING, RECEIVING AND INSPECTION

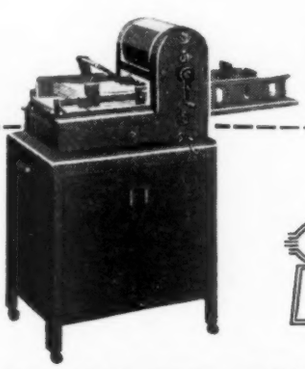
The essence of this single-writing method is that one writing on a Mimeograph form-topped stencil sheet, produces, on the Mimeograph duplicator, a combination purchase order with receiving and inspection records.

Each is produced in sufficient quantities and distributed so that everyone who needs to know does know *when* material is ordered, *what* is ordered, *what* is received, *what* is accepted, *what* is in the storeroom bins.

COMPLETE PRODUCTION CONTROL

Here is a production control paper work plan that cuts manufacturing costs by getting jobs into production sooner and by preventing errors and delays.

The system set down in detail in the folder can be precisely adjusted to fit the specific needs of every type and size of industry.



Mimeograph duplicator

*MIMEOGRAPH is the trade-mark of A. B. Dick Company, Chicago, registered in the U. S. Patent Office

GET YOUR FREE COPIES BY MAILING COUPON ⇨

A. B. DICK COMPANY, Dept. P-246, 720 W. Jackson Boulevard Chicago 6, Illinois

Send me literature on the following:

☐ Purchasing, Receiving and Inspection

☐ Complete Production Control

NAME.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....

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Send for your data file, today. It contains complete information . . . shows how photocopying is used in every department . . . illustrates graphically the "how" and "why" of this unique and simple procedure. It's yours for the asking . . . no strings attached.

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2849 N. Clark St., Dept. NG26
Chicago 14, Illinois

Send me, without obligation, your file of complete information about Photocopying and its uses in every department—including a 20-page, fully illustrated book.

NAME .....
COMPANY .....
TITLE .....
ADDRESS .....
CITY ..... STATE .....

Form 12000 APCo.

BIGELOW-SANFORD CARPET CO., Inc.

Yarn Test _____ Mill Date _____

Size and Kind of Yarn _____ Vendor _____

Receiving Report No. _____ Date _____ Purchase Order No. _____

Special Marks _____ No. Bales _____

REPORT

Open Air Weights (60 yd. Basis)	Grains	Count	Standard
Total			
Average			

Bone Dry Weight Calculated
% Moisture Regain
Conditioned Weight
Yards per pound (actual)
Yards per pound (corrected)

Breaks	Elongation	Twist
lbs.	inches	turns per inch

Summary	Average	Standard
Breaking Strength	_____ lbs.	_____ lbs.
Elongation	_____ %	_____ %
Twists per inch	_____	_____

Remarks:

Copies to:
Purchasing Dept.
Technical Director
Laboratory

Yarn Inspection form

(*Continued from page* 245)

on a pre-determined inventory basis, as for example, 30 days, rather than a predetermined number of finished goods units to be manufactured.

"To that end we developed the so-called "Schedule Book" which, it is to be noted, provides for information on receipts, consumption, inventory and materials on order for future delivery as well as deliveries which have been made against those orders. The information is posted each week from stock reports provided for us by the Stores Department. The deliveries made by various vendors are also posted. We total up the consumption each month at our regular Accounting Inventory period. The result is a more or less complete picture at a glance on any given sizes of yard, fuel or other item purchased in large bulk."

Mimeographed Follow-up Forms

Here are examples of a few simple mimeographed follow-up forms used by the Purchasing Department of the District of Columbia, Washington, D. C., Roland M. Brennan, Purchasing officer.

As a part of the follow-up system, a mimeographed postal is used to request information on delivery of items ordered but not yet delivered and the time of delivery to be expired, as follows:

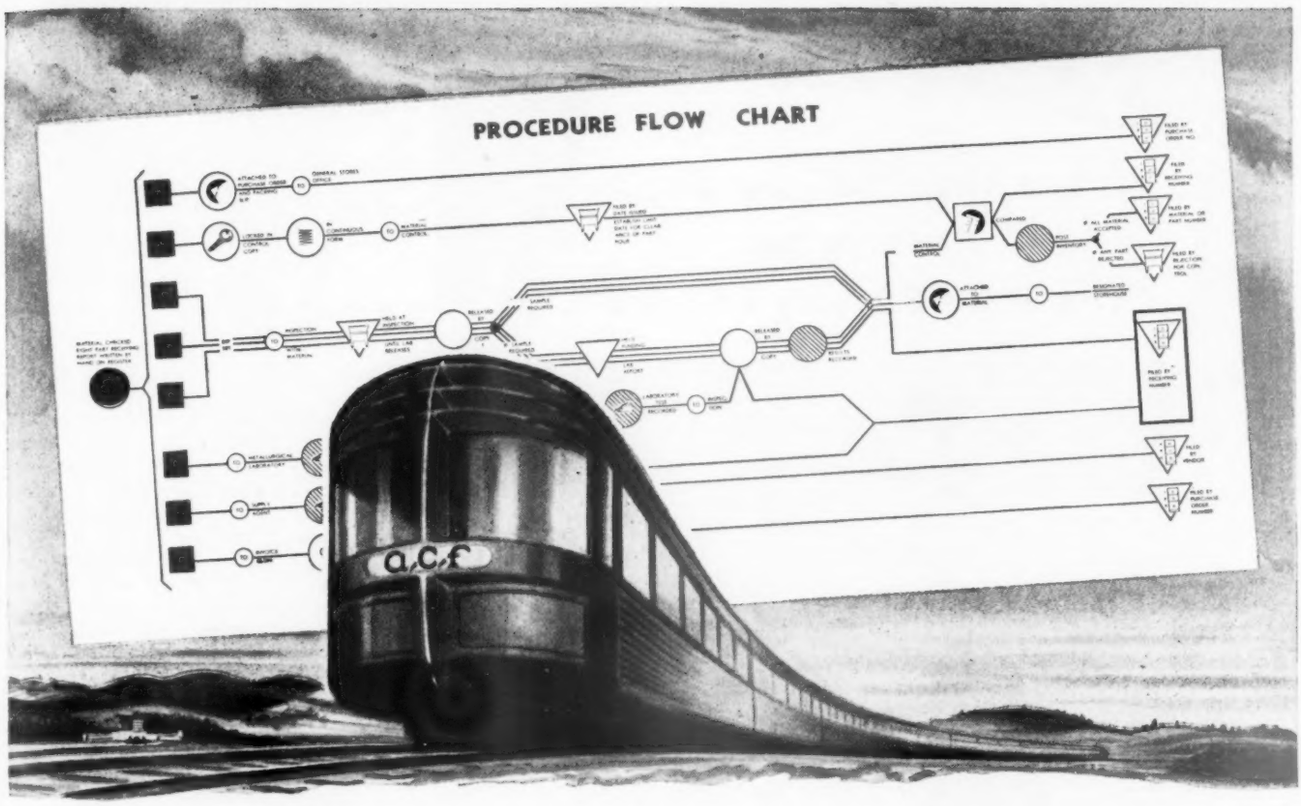
Subject: Order ——
Date ——

"Our records show that delivery is due on the above order.

"Kindly advise by return mail (referring to this card) when we may expect to receive the material.

"Thanks for your cooperation."

(*Continued on page* 252)



Standard Register helps a,C,f, streamline record systems

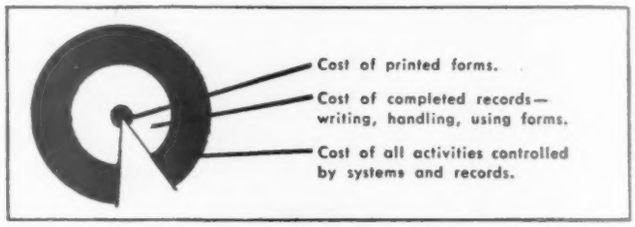
The material control system by Standard . . . the coaches by ACF . . . both are streamlined . . . to reduce costs . . . to increase speed

CAN THE receiving process be speeded up two or three days? Can all possibilities of receiving material without proper authority, identification or inspection be avoided?

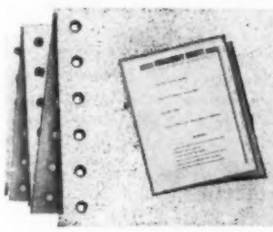
The American Car and Foundry Company asked these questions 18 months ago. The answer, shown in the flow chart above . . . results of Standard Register's paperwork simplification techniques . . . proved invaluable in speeding production of heavy war equipment. Today, it's proving equally valuable . . . speeding production of modern lightweight coaches for America's railroads . . . in reducing costs and delays.

Operations analyzed by Standard Register's Systems Analysts

To streamline record systems of control Standard makes a thorough study of the existing system . . . with every paperwork operation visualized on a flow-chart. The system is analyzed and re-charted using Standard's proven paperwork simplification methods. Results at ACF . . . 51 paperwork operations reduced to 36 . . . better control and flow of material giving far greater savings than any resulting in the cost of the forms, or their processing.


Cost of printed forms.
Cost of completed records—writing, handling, using forms.
Cost of all activities controlled by systems and records.

Does your business offer similar opportunities for cost cutting . . . for better business control? Talk to a Standard Register representative, learn how other companies gain savings beyond the cost of printed forms, and their processing.



WRITE TODAY for Formcraft Digest D-189 which explains the above chart in detail. Ask for the "Receiving" booklet, too. It is a thorough study of the business function of receiving.

THE STANDARD REGISTER COMPANY

Manufacturer of Record Systems of Control for Business and Industry

402 CAMPBELL ST. • DAYTON 1, OHIO

Pacific Coast: Sunset McKee-Standard Register Sales Co., Oakland, California. Canada: R. L. Crain Limited, Ottawa. London: W. H. Smith & Son, Ltd.

Let the file you use determine the PAPER you choose

If it's worth keeping, keep it on a Weston Paper

Quite obviously, you need a different kind of paper for much-handled, hard-working records of long-term importance than for here-today-gone-tomorrow notations. But the problem of selecting the one best paper for either type of paper work need not be difficult. Simply evaluate your forms, blanks, letterheads and record sheets in terms of use and life expectancy. Then see that those which you plan to *keep* are produced on a WESTON Paper. Your printer or paper supplier will assure you that there is no better way to protect your important records than to keep them on a WESTON cotton fibre content Ledger, Bond, Index or Machine Accounting Paper.

BYRON WESTON COMPANY
Dalton, Massachusetts

Weston *Makers of Papers for Business Records*

WESTON PAPERS · PROTECT YOUR RECORDS

MAKING MAJOR ADDITIONS TO SMITH-CORONA PLANTS

Construction is now under way on two new additions which will increase by approximately 50 percent the plant facilities of L. C. Smith-Corona Typewriters, Inc. in Syracuse and Groton, New York. Scheduled for completion early in 1946, the new additions, equipped with modern machinery, will greatly improve manufacturing facilities and make for greater production efficiency.

The new building in Syracuse will be eight stories high, 60 feet across the front and a block long, of reinforced concrete — brick faced. Completely modern throughout, the new addition will house the finishing department, assembly departments, cafeteria, engineering department, factory and general offices, heat-treating and plating departments.

As part of the Syracuse construction program, which is scheduled for completion in June of 1946, several one-story additions will be torn down and a one and two-story wing for raw material storage will be erected in their place.

Other alterations will be made in the present structure and in yard facilities. The general program includes installation of modern direct-drive precision machine tools.

Work is also progressing on the modern addition in Groton, greatly increasing factory floor space. Plans for the Groton plant include the installation of new precision machine tools. The construction schedule calls for completion of construction and alterations by April, 1946.

* * *

HUDSON PULP & PAPER SPONSORS "AUNT MARY" BROADCAST

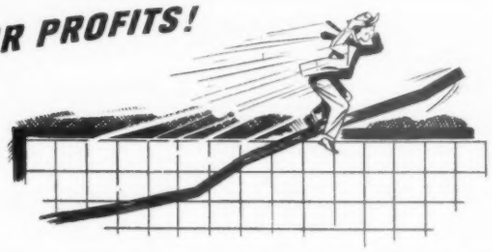
Aunt Mary, 15-minute weekday radio serial, sponsored by Hudson Pulp and Paper Corp., makers of paper napkins, paper towels and tissue, will be launched on five major eastern radio stations January 14th, according to the Duane Jones Company, agency handling the account. This serial, already a popular West Coast air feature, was packaged in Hollywood by Lee Crosby, of C & F Radio Productions. Initial group of eastern stations on which Hudson Pulp and Paper Corp. will sponsor Aunt Mary include WOR, New York, 9:15—9:30 A.M.; WBAL, Baltimore, 9:45-10:00 A.M.; WBZ, Boston, and WBZA, Springfield, Mass., 1:45-2:00 P.M.; KYW, Philadelphia, 1:45-200 P.M. It will be heard daily, Mondays through Friday, on all stations.

Team up

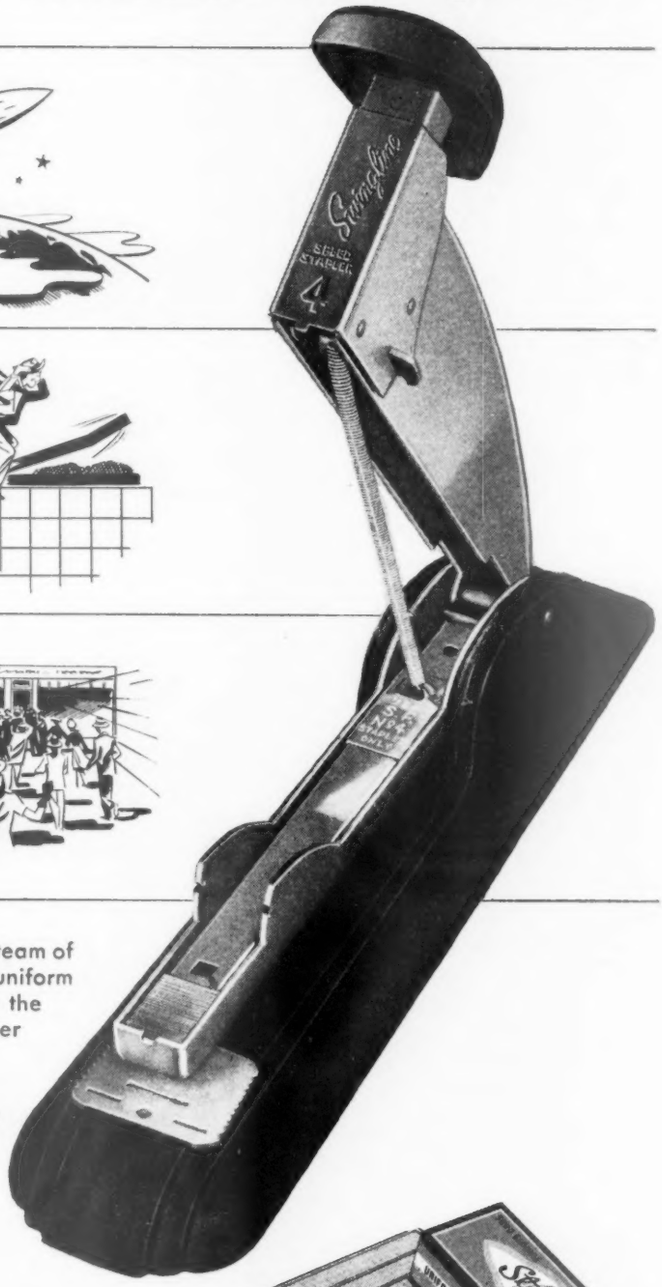
with the world's speediest stapling team

WHOOSH YOUR SALES!

ZOOM YOUR PROFITS!



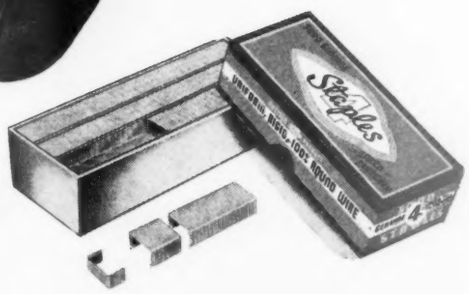
WOW YOUR CUSTOMERS!



Here's a business-builder... a good-will-winner... the dream team of stapling! The fastest, smoothest-working *stapler!* Completely uniform *staples* precision-engineered of 100% round wire to do the neatest stapling job! It's the Swingline team of No. 4 Stapler and No. 4 Staples!

Flick back the head and the staple channel is wide-open for split-second loading. Work the stapler and there's no buckling, none of the clogging caused by surplus glue on ordinary staples. Team up with Swingline — the most efficient and speediest of stapling teams!

SPEED PRODUCTS CO., LONG ISLAND CITY 1, N. Y.



SPEED

Swingline

WORLD'S SPEEDIEST STAPLING TEAM!

COMMERCIAL FORMS AND SYSTEMS

An ally of modern management, Reynolds and Reynolds *is* one of the world's largest suppliers of printed or lithographed control and operational forms.

- CARBON INTERLEAVED SYSTEMS
- BUSINESS MACHINE FORMS
- PAYROLL CHECKS and SYSTEMS

Effective Advertising Literature, Distinctive Stationery and Business Forms of every kind

The REYNOLDS & REYNOLDS COMPANY • DAYTON 7, OHIO

Established 1866

SALES OFFICES IN MANY PRINCIPAL CITIES

(*Continued on page* 248)

Following receipt of reply from supplier as to delayed deliveries, a mimeographed notice is sent to the department concerned, which reads as follows:

"Order No.
"Contractor—
"Our recent follow-up on above order reveals that the material involved has been shipped by the contractor and that delivery may be expected not later than—
"Therefore, please note your records accordingly and inform this office if the delivery does not come to you by the date stated."

A Friendly Job

Mr. Brennan likes to meet all obligations promptly, and as "a friendly jog of the elbow" to urge department heads to expedite payment of contractors' vouchers, sends the following mimeographed memorandum to department heads concerned for their prompt acknowledgment of receipt of materials or O.K. on statements:

"Prompt payments of our suppliers' accounts promotes good will. It is to the District's and your department's interest that payments of invoices be made as soon as possible. Otherwise, suppliers are discouraged from doing business with us.
"Will you please cooperate."

Where vendors' invoices or statements of account cannot be identified with a purchase order, a mimeographed post card notice reading as follows is mailed to them:

"We are sorry we cannot identify your invoice/statement dated————just received.
"If you will submit a properly executed voucher on the District of Columbia form, complete with our order number, we will endeavor to speed up your payment."

Purchase Order and Purchase Order Change

THIS Purchase Order form and Purchase Order Change form were supplied by J. F. Mispley, Chief, Bureau of Purchases, State of California, Sacramento, Calif. The purchase order form (next page) is a one-time carbon, snap-out form, of which eight copies are made, identified and distributed as follows:

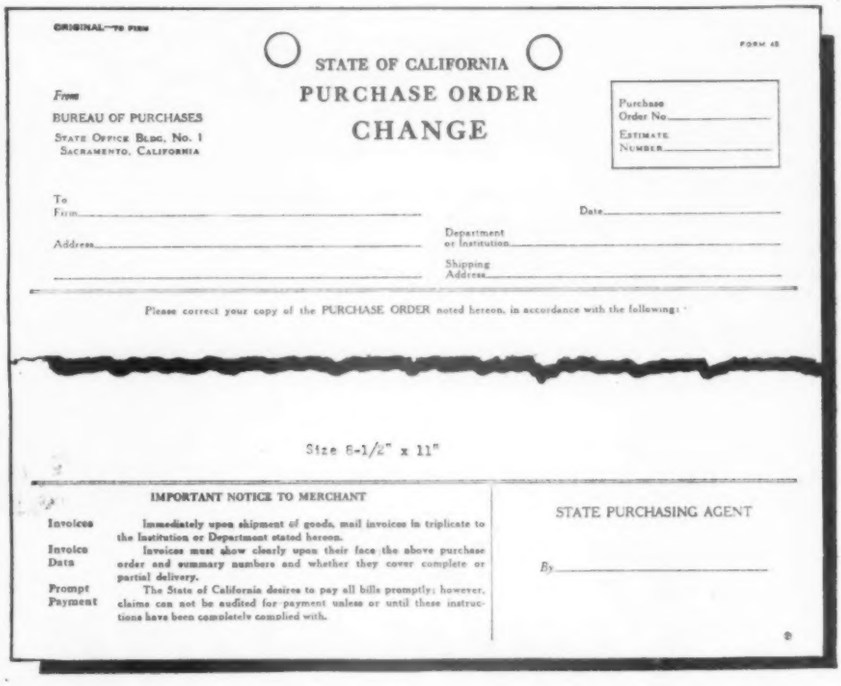
Original—to vendor;

Duplicate—Institution or Department Bookkeeper's file;

Triplicate—For Receiving File;

Quadruplicate — Purchasing Agent's File;

The rest of the copies carry in the lower right hand corner only the checking spaces "Posted to Stock Cards" and "Operator—use check mark, if possible. When Delivery Complete," as illustrated in "Third Copy, Receiving File." These go to the ordering department which



ORIGINAL—TO FIRM

STATE OF CALIFORNIA

FORM 15

From
BUREAU OF PURCHASES
STATE OFFICE BLDG. NO. 1
SACRAMENTO, CALIFORNIA

PURCHASE ORDER
CHANGE

Purchase Order No.
ESTIMATE NUMBER

To
Firm
Address

Date
Department or Institution
Shipping Address

Please correct your copy of the PURCHASE ORDER noted hereon, in accordance with the following:

Size 8-1/2" x 11"

IMPORTANT NOTICE TO MERCHANT

Invoices — Immediately upon shipment of goods, mail invoices in triplicate to the Institution or Department stated hereon.

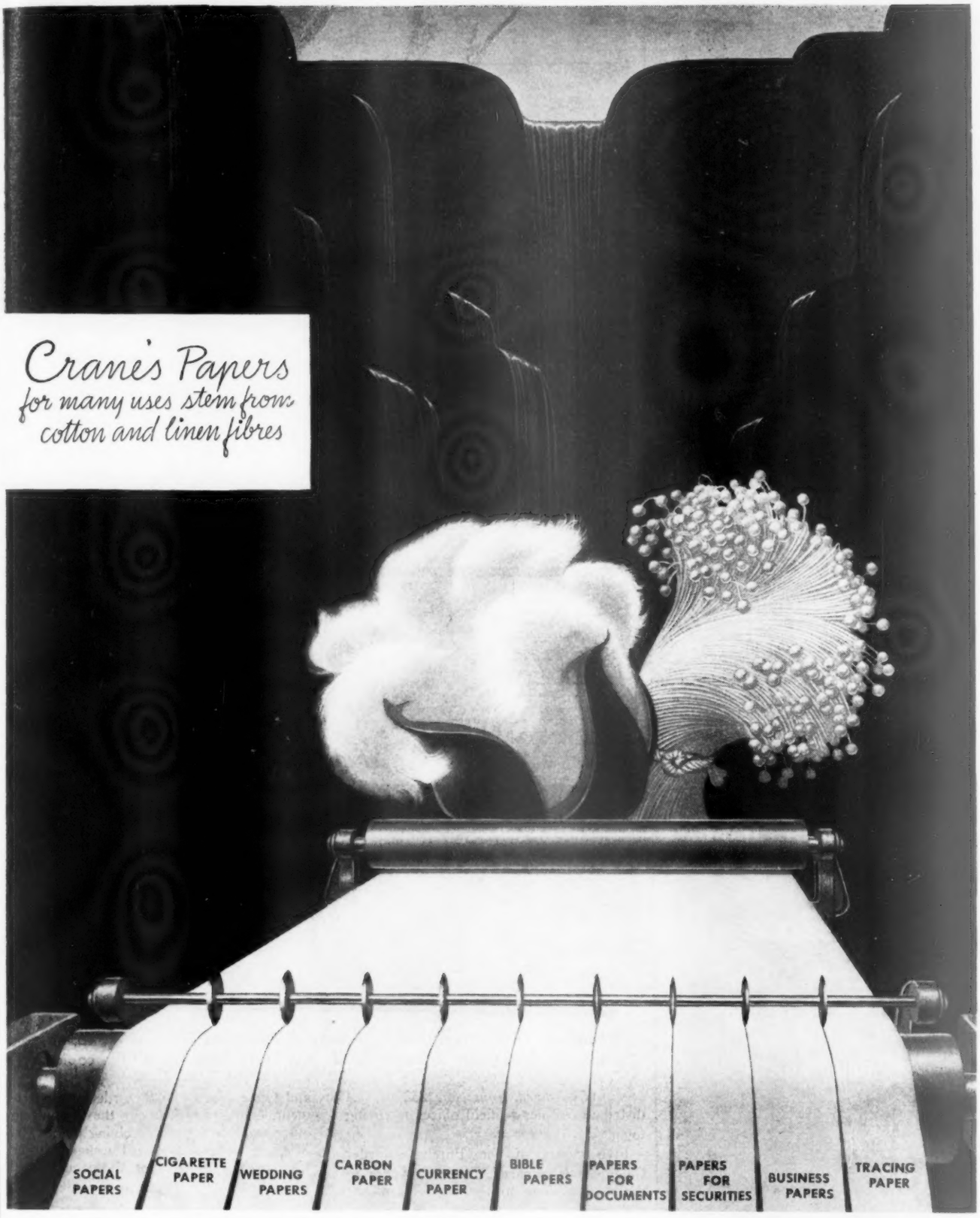
Invoice Data — Invoices must show clearly upon their face the above purchase order and summary numbers and whether they cover complete or partial delivery.

Prompt Payment — The State of California desires to pay all bills promptly; however, claims can not be audited for payment unless or until these instructions have been completely complied with.

STATE PURCHASING AGENT

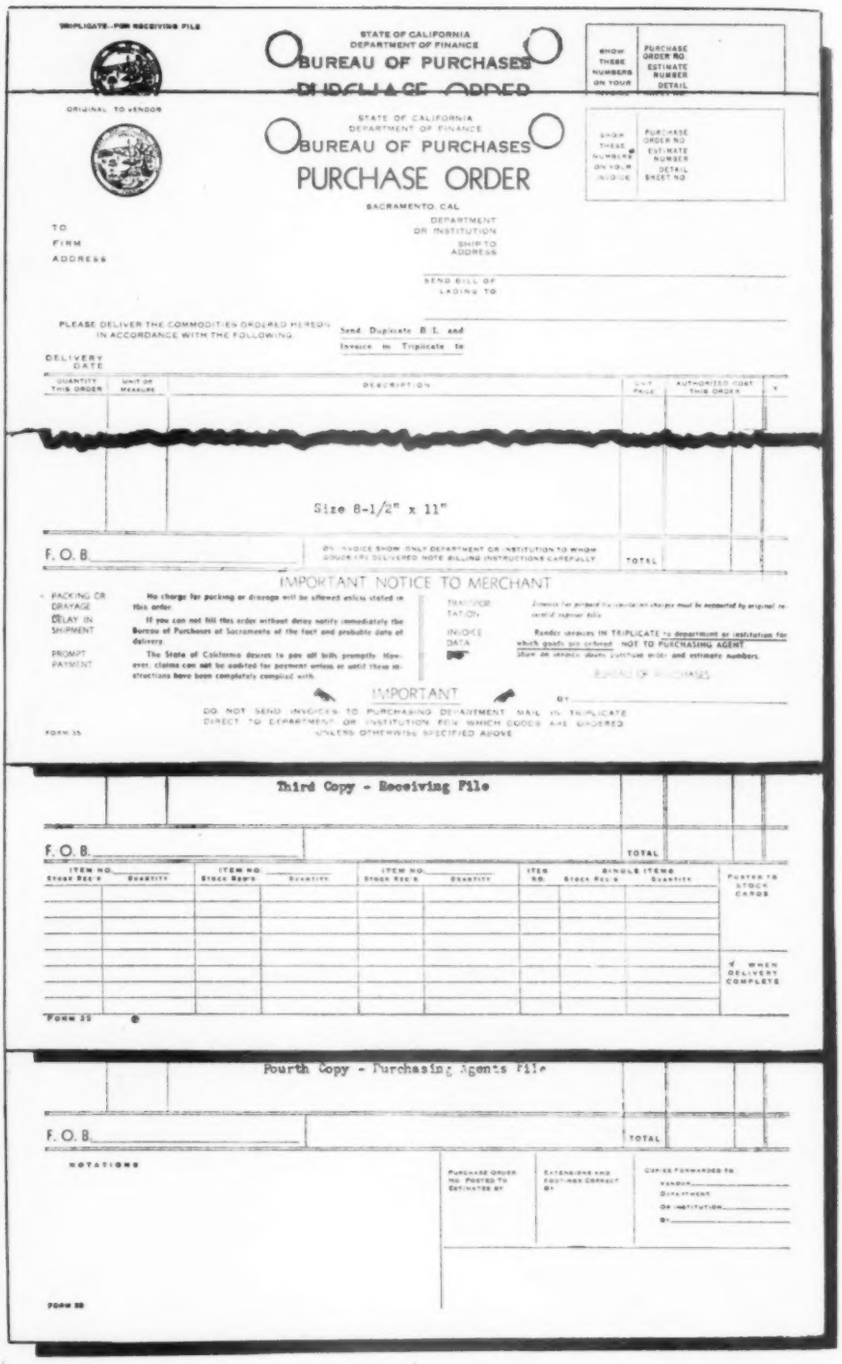
By

(*Continued on page* 254)



Crane holds fast to its 145 years of making papers from cotton and linen fibres *only* for the sound and practical reason that no other materials can give paper the same enduring quality, the same distinctive, distinguished character. With hands of skill, on modern machines, Crane converts these fibres—born of the soil and the sun—into papers for business, personal and social use. Some are thin papers; some are papers of greater substance; all are papers that will stand the test of time and usage . . . speak for you as you would speak for yourself . . . carry your words and records into the years to come. In buying paper, the Crane watermark is your guide to papers of traditional quality produced in the modern manner.

CRANE'S FINE PAPERS
MADE IN DALTON, MASSACHUSETTS • SINCE 1801



Purchase Order Form used by Bureau of Purchases, State of California, showing lower part of Receiving file and Purchasing Agent's file copies.

(*Continued from page 252*)
distributes copies to field offices requiring them.

Five copies of the Purchase Order Change are prepared. One copy goes to the vendor; one to the auditor's office; one is for the Purchasing Agent's file; and two copies go to the ordering department, one of which is for the accounting office and one for the receiving point. Mr. Mispley states that the Purchase Order Change is authority for those concerned to correct any other copies which they may have.

PACKAGING EXPOSITION

The Packaging Exposition of 1946, sponsored by the American Management Association, which opens in Atlantic City's Public Auditorium on April 2nd for a four-days showing, will occupy an area of nearly four acres. Coincident with the exposition will be the AMA Packaging Conference in another section of the same building. The exhibits will include wartime developments. An attendance of between 6000 and 7000 is anticipated.

with EITHER hand—

find employee withholding tax QUICK with

PAYS FOR ITSELF IN 24 HOURS OF OPERATION

E-Z DIAL TAX FINDER

REG. U. S. PAT. Off.

while other hand is free for writing.

Absolutely Accurate —

Official Tables

Minimum eye-strain

3-Dimensional Plexiglas dial eliminates errors, concentrating vision at a fixed point.

Complete with tax chart for weekly, bi-weekly, semi-weekly, monthly or daily payroll periods.

Signals in green when no deduction necessary.

Considers only one wage at a time, eliminating mistakes.

Takes little desk space — less than half the size of a letterhead.

Will last for years — New charts available if tax changes. Complete new set only $2.00.

incredibly **fast and efficient! Made of sturdy materials, finished in olive green. You must see the revolutionary Plexiglas dial yourself to realize what a time-saver and eye-saver you're getting. Take advantage of our offer at the right . . . . TODAY.**

AVAILABLE NOW

REDIFIXT 1946 W-2 Tax Withholding Form

Millions sold in 1945 — get your order in — sample on request.

10 DAY TEST

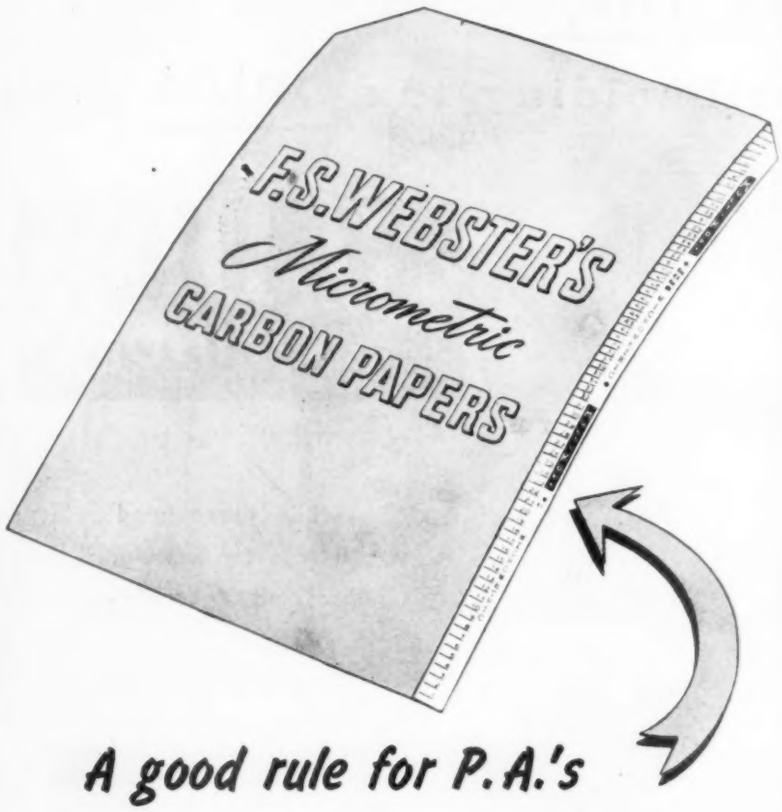
To convince you that this is the best tax finder . . . money back guarantee.

LIST PRICE

$12.50

CONSOLIDATED BUSINESS SYSTEMS, INC.

30 Vesey Street Dept. 002 New York City 7



A good rule for P.A.'s

There's only *one* carbon paper with a numbered scale. It's called Webster's Micrometric — and it helps secretaries in business offices from coast to coast to turn out more evenly spaced letters and reports. Saves time, too.

This exclusive feature is typical of the extra values offered by F. S. Webster Company. That's why it's a good rule for P. A.'s to get in touch with Webster, whenever you need carbon papers and typewriter ribbons; duplicating carbon papers and accessories; carbon paper ribbons for photo-offset work; ribbons and carbons for Elliott-Fisher, Addressing, Adding and International Business Machines. Consult your nearest dealer or write to F. S. Webster Co., 7 Amherst Street, Cambridge 42, Massachusetts.

WEBSTER'S

Micrometric Carbon Papers and Typewriter Ribbons

EVERSHARP RECEIVES NAVY ACHIEVEMENT AWARD

Eversharp, Inc., was recently awarded one of the 60 Certificate of Achievement Awards given in recognition of exceptional accomplishment in behalf of the United States Navy and for meritorious contribution to the national war effort.

Commander S. J. Singer in making the award to Eversharp said: "It is my distinct pleasure to make this award to Eversharp in return for the splendid efforts by both the men and women in its organization in support of the war production program. This award is made by the Navy in sincere appreciation to the men and women who gave their whole-hearted cooperation."

In addition to diverting its major production to Army and Navy needs during war time, a separate division of Eversharp was completely given over to the exclusive manufacture of precision aviation equipment for the Navy.

* * *

GEORGE C. BRAINARD ELECTED PRESIDENT OF ADDRESSOGRAPH-MULTIGRAPH

The board of directors of The Addressograph - Multigraph Corporation, Cleveland, Ohio, elected George C. Brainard president and general manager to

George C. Brainard, president of Addressograph-Multigraph Corporation.

succeed Joseph E. Rogers, who continues as chairman of the executive committee and a member of the board of directors.

The action was announced by the directors as a step designed to increase the company's management facilities in anticipation of greatly enlarged postwar activity by the company in the business simplification machinery fields. Mr. Brainard's appointment has been contemplated for some time and marks an important step in increasing the company's organizational strength.

Simultaneously, it was announced that Mr. Brainard had resigned as president of the General Fireproofing Company of Youngstown, a position which he held from 1928 to date. He was on leave of absence from the Company from 1942 to 1944 in Government service. He will continue as a member of the Company's board of directors.

The new Addressograph-Multigraph president is chairman of the board of

(*Continued on page* 258)

"and now we bring you..."

A few nights ago, when the radio wafted several of those ear-splitting introductions our way, it set us thinking. The build-up for each star made us wonder whether we say enough about what we're offering.

INTERNATIONAL TI-OPAKE, for instance—should we launch forth on what a top-notch performer it is? Should we dwell on its versatility—how suitable for Letterpress and Offset? Or give details about its extreme opacity which allows both sides to take heavy printing? Should we tell what a fast seller it is in the field—even if we can't supply the full demand right now?

But then we realized . . . INTERNATIONAL TI-OPAKE is so much in demand that word of its unusual qualities surely *had* gotten around! Even without being told, people naturally expected it to be tops in its class—for *that's* the kind of product they're accustomed to getting from the world's largest maker of paper. International Paper Company, 220 East 42nd Street, New York 17, N. Y.

INTERNATIONAL PAPERS *for Printing and Converting*

FIRST IMPRESSIONS GO BY MAIL!

Be sure your letterhead gives the *right* impression of your organization. Your printer is the man who can best advise you on this important matter. Paper is an old story to him. He handles it every day. He can tell you in a flash whether it has the quality you require. For executive letterheads ten-to-one he will recommend Rising Parchment . . .

Rising Parchment

✓100% rag ✓Super Opaque
✓Four Weights
✓Distinctive unglazed parchment finish
✓6 standard sizes of envelopes

When you want to KNOW... go to an expert!

Rising Papers

Rising Papers

Ask your printer... he KNOWS paper!

Rising Paper Company, Housatonic, Mass.

For advertising and book rates, call your agency or write . . .

MacRae's Blue Book

A DIRECTORY OF AMERICAN INDUSTRY

26 E. HURON ST. . CHICAGO 11, ILL.

(*Continued from page* 256)

the Federal Bank of Cleveland, a director of the Youngstown Sheet & Tube Company and also holds directorships in the Pittsburgh, Youngstown and Ashtabula Railroad and the Youngstown Municipal Railway. He also has been a director of Addressograph-Multigraph for several years and has been active in the formulation of the company's postwar production plans.

Mr. Brainard has a breadth of experience which will be invaluable to him in his new position. While on leave of absence from General Fireproofing, he was chief of the tools branch of the production division and later deputy director

J. E. Rogers, chairman of executive committee and member of board of directors.

of the production division and director of the tools division of the War Production Board. He was also a member of the advisory board of the Cleveland Ordnance District. As early as 1918, however, Mr. Brainard gained his initial war experience as a staff expert with the Production Division of the Ordnance Department of the U. S. Army, where he was in charge of shell forgings. In 1940 he was appointed assistant district chief of the Cleveland Ordnance District.

He also served as co-ordinator of the National Defense Contract Service in the office of Production Management of the Fourth Federal Reserve District in 1941.

* * *

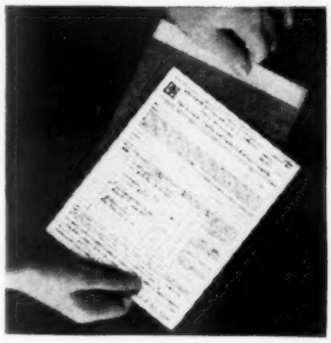
REMINGTON RAND ANNOUNCES REDI-FILES FINGERTIP ACCESSIBILITY

Redi-File, newly developed type of hanging file folder, is claimed vastly increases efficiency of executives' personal files as well as general files. Redi-File, tailored to fit any size desk drawer, gives executives fingertip accessibility of working papers. Easy-to-read angle tabs on hanging folders make papers easy to locate. The arrangement of the folders requires no follower block to hold papers upright. Folders cannot sag or bind—whether they be few or many, full or empty.

Redi-File fits any standard filing drawer and requires no revision of present filing system. Variadex or other filing methods — alphabetic, subject, numeric, or Soundex — can be used with Redi-Files, thereby conserving the advantages of the filing method used while adding the mechanical advantages of

(*Continued on page* 260)

When your employees must spend time fiddling with forms—*productive time is lost.* Forms that require needless repetitive handling, inserting carbons, jogging and other such wasteful routine work before a job is started, slow production to a standstill—waste your time and employees' ability.

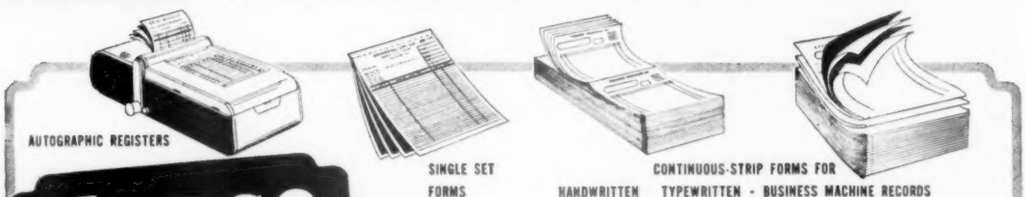


Modern Uarco forms eliminate such time-wasting jobs. These pre-fabricated, multi-copy forms come ready for typing or writing—carbons are in place, papers perfectly aligned, and a number of clear copies can be typed at once to expedite work in a number of departments.

Creating forms is Uarco's business . . . creating and designing forms that save time and money while speeding the work from purchasing to billing. No matter what kind of records you keep, Uarco has forms to fit individual needs.

Call your Uarco representative today. Spend a half hour with him. It may well result in substantial savings of time and money. Or write for full information. UARCO, INC., Chicago, Cleveland, Oakland • *Offices in All Principal Cities.*

For instance . . . **Uarco E-Z-Outs. One of many Uarco time-saving forms. Carbons inserted, ready aligned, these forms can be used in typewriter or for hand-written records. A dozen or more clear copies can be made by typewriter or 5 by hand. Write for full details.**


AUTOGRAPHIC REGISTERS
SINGLE SET FORMS
CONTINUOUS-STRIP FORMS FOR HANDWRITTEN TYPEWRITTEN · BUSINESS MACHINE RECORDS

UARCO

BETTER BUSINESS FORMS

EBERHARD FABER ERASERS for *Clean Corrections*

NECESSARY to every office, is the Quality in EBERHARD FABER Erasers that makes mistakes "come clean". Your Stationer has a complete selection of erasers for pencil, ink, or typewriter.

(Continued from page 258)

Redi-File folder suspension. These mechanical advantages include: uniform height of tabs in their preselected positions; avoidance of sagging and slumping of folders; ease of removal and replacement of folders; wide V-opening for scanning folders and filed papers for quick reference; and extremely rapid location of folders and individual documents.

Constructed of durable Remcraft stock with metal hangers and tabs, Redi-File folders far outwear other types. Tabs are available in a variety of sizes. Complete information can be obtained from any Systems Division branch office or by writing to Systems and Methods Research Department, Remington Rand Inc., 315 Fourth Avenue, New York 10, N. Y.

"BREW" TOWNE IN CHARGE OF NATIONAL BLANK BOOK COMPANY'S CHICAGO OFFICE

W. Brewster Towne has been placed in charge of the operations of the National Blank Book Company in the Chicago area. He was recently released from active duty in the U. S. Naval Reserve with the rank of Lieutenant Com-

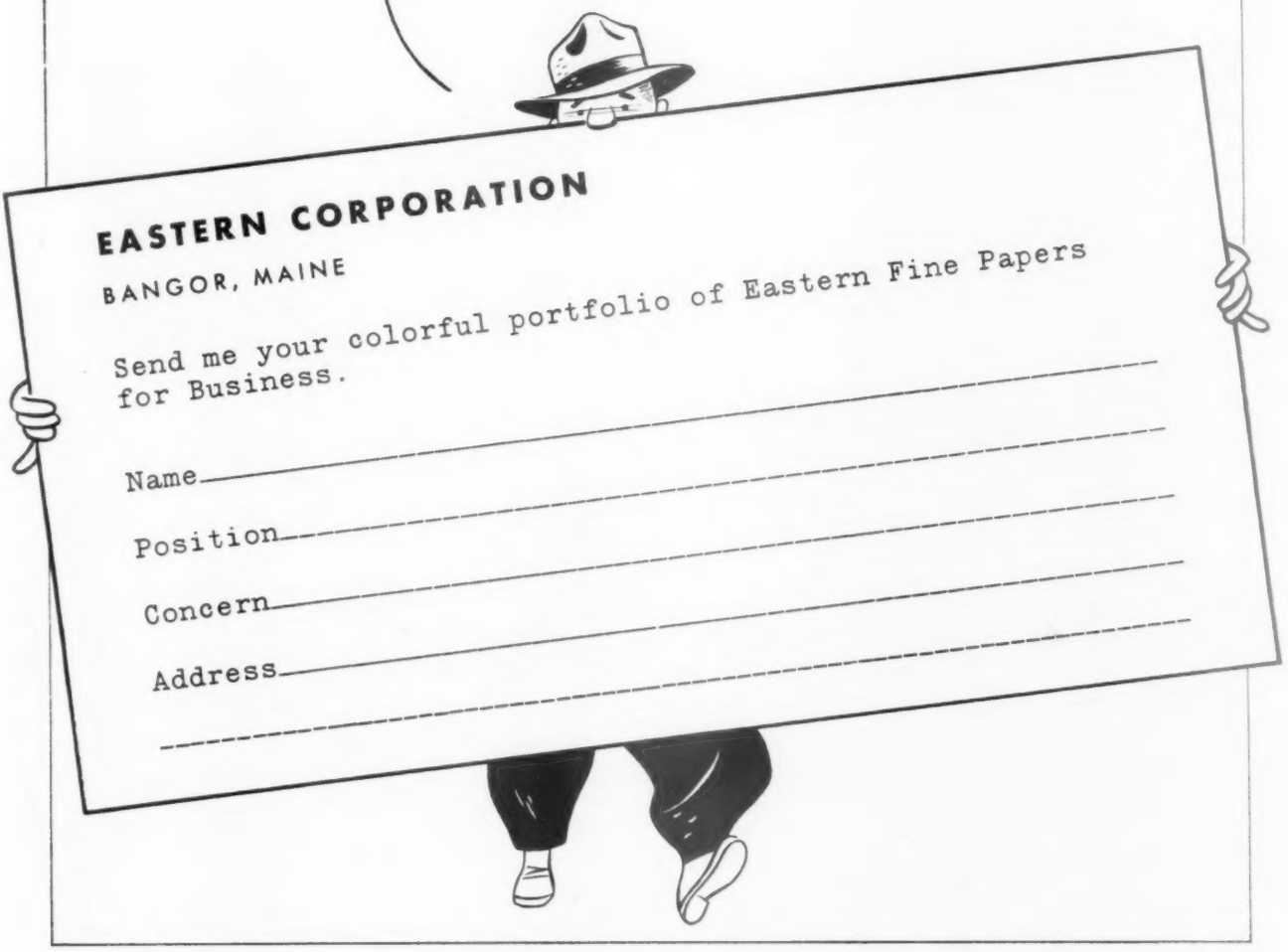
W. Brewster Towne

mander. He entered the service in June 1941, six months before Pearl Harbor, to receive special training at the Supply Officers' Training School at Harvard Business School.

Towne went to sea in September 1941 as Supply, Disbursing and Commissary Officer of the USS Jamestown which became famous for its work as tender for PT boats in the South Pacific. This ship took the first PT boats into Guadalcanal in October, 1942, where a base established to supply these boats, a task for which the Presidential Unit Citation as part of the First Marine Division in Guadalcanal was awarded. In 1943 Mr. Towne was attached to the U. S. Naval Supply Depot at Noumea, returning to the United States in November of that year. Here he joined the staff of the Navy Supply Corps School at Harvard Business School where he served as Executive Officer of the Midshipmen Officers' Unit until released from service.

Mr. Towne is the son of Vice President J. M. Towne of the National Blank Book Company, and has worked in many capacities in the factory, office, and on the road. He was a member of the New York office force for six months before joining the Navy.

Is **THIS COUPON** Big Enough for You?



EASTERN CORPORATION

BANGOR, MAINE

Send me your colorful portfolio of Eastern Fine Papers for Business.

Name_____

Position_____

Concern_____

Address_____

For once, here's a practical coupon ... plenty of room to fill in your name, title, and address ... and easy to rip out and send back.

We wanted to make this coupon practical because we believe that you will be glad to get a copy of our portfolio of "Eastern Fine Papers for Business."

Filled with interesting colorful specimens, this portfolio shows how Atlantic Bond, Ledger, Duplicator, and Mimeo papers as well as our Manifest and Volume line can be used for all kinds of business requirements.

Send for it today.

Atlantic Bond

MADE BY
EASTERN CORPORATION
BANGOR, MAINE

free TO THE EXECUTIVE WHO TAKES PRIDE IN HIS LETTERS

New revised letterhead paper comparison kit. Contains positive proof of the superiority of Anniversary Bond, the brilliant white, prestige-building letterhead paper by Fox River.

Today, when you sign your mail, examine your letterhead critically. Look at the watermark. Does it read "100% cotton fibre", "100% rag", or "all-rag"? If not, it's not the finest available. Anniversary Bond, a Fox River paper, is such a paper. It's a 100% cotton fibre paper of highest quality. Prove it to yourself with this letterhead paper "Comparison Kit". Write for your copy today.

THE WATERMARK IS YOUR QUALITY GUARANTEE . . . BE SURE IT READS 100% COTTON FIBRE — BY

FOX RIVER

Fine Papers SINCE 1883

FOX RIVER PAPER CORPORATION
403-B S. APPLETON STREET
APPLETON, WISCONSIN

BOND, LEDGER, ONION SKIN — IN 25-50-75 AND 100% COTTON FIBRE CONTENT

WALTER BENDER MADE PRESIDENT OF GENERAL FIREPROOFING

Walter Bender has been elected president of the General Fireproofing Co., Youngstown, Ohio, manufacturers of metal office equipment. He succeeds George C. Brainard who has become president and general manager of the Addressograph-Multigraph Corporation, Cleveland. Mr. Bender joined The General Fireproofing Company in 1918 as clerk in the office of the plant superintendent. Through the successive years he became head of the time study department, manager of shipping and warehousing, and later, production manager.

Walter Bender

In 1928 he was named general superintendent, and in 1936 he was made vice president in charge of operations, the position he leaves to become president.

G. R. Farrell who joined the company in 1913 and who has been employed in nearly every division of the business, will continue as vice president in charge of purchases.

INTRODUCING AN OLD FRIEND MR. PURCHASING AGENT

The "G. S. M's. Column" of Achievement, official publication, Moore Business Forms, P. M. B. Division, Sales Organization, Emeryville, California, recently published the following introduction "to an old friend," by General Sales Manager G. R. Oliver:

"Today I would like to introduce you to an old friend, because I'm afraid you might have forgotten him.

"His name is Mr. Purchasing Agent and he has once again become a key figure in the life of every salesman.

"Mr. Purchasing Agent is undergoing a definite change of attitude now that V-J Day has been proclaimed. He has suddenly become particular. He is asking more questions. He is demanding, or at least expecting, better service and he is commanding genuine respect from salesmen who understand his position and responsibilities.

"Mr. Purchasing Agent is not "getting tough" simply because he is an ornery individual. He is, instead, once again a purchasing agent in the true sense of the word. His attitude is not arbitrary, but justified by his responsibilities.

"Our Systems Engineers will have far less trouble and sell a great many more purchasing agents if they stop for a

(*Continued on page 264*)

This night-shift is getting to be a habit

Here it is night and *still* we're not finished. Overtime, all the time.

This *is* getting to be a habit.

Blame overtime on too much rush business, too many out of town, too much flu, too much new help. But the fact remains that lights burning after hours, and coffee and hamburgers sent in, are usually signs of inefficiency somewhere along the line. Something's wrong.

A weakness in business forms is often part and parcel of the trouble. Moore Business Forms, Inc., designs and prints business forms of every description for thousands of businesses, large and small. Net result is less error, less confusion—and savings that mount up to real figures.

For example: For 20 years, a large auto supply house has used 3,200,000 sets of a particular Moore business form. Savings range upward of $15,000 a year—not counting the 33⅓ per cent reduction in carbon-paper costs.

Moore Business Forms, Inc., consists of companies long under Moore ownership, now also under the Moore name. Get in touch with headquarters of your nearest Moore division, as listed below, or its local office. *Moore stands ready to supply you with everything from a simple sales book to the most intricate multiple-copy form.*

AMERICAN SALES BOOK CO., INC., NIAGARA FALLS AND ELMIRA, N. Y.
PACIFIC MANIFOLDING BOOK CO., INC., EMERYVILLE; LOS ANGELES, CALIF.
GILMAN FANFOLD CORP., NIAGARA FALLS, N. Y.
COSBY-WIRTH MANIFOLD BOOK CO., MINNEAPOLIS, MINN.
MOORE RESEARCH & SERVICE CO., INC., NIAGARA FALLS, N. Y.
SOUTHERN BUSINESS SYSTEMS, INC., ORLANDO, FLA.
MOORE BUSINESS FORMS, INC. (New Southern Div.), DALLAS, TEX.; ATLANTA, GA.
In Canada—Moore Business Forms, Ltd., succeeding Burt Business Forms, Ltd., Toronto
Western Sales Book Co., Ltd., Winnipeg and Vancouver
National Sales Check Book Co., Ltd., Montreal

MOORE BUSINESS FORMS, INC.

ADV. BY N. W. AYER

Prominent Users of Strathmore Letterhead Paper: No. 65 of a Series

this LETTERHEAD went to town with MR. HAM

Mr. Ham went to War when John Morrell and Co. concentrated on producing meats for our armed forces and allies. Now civilian needs are being supplied in larger measure with Morrell Pride, E-Z Cut Hams, and delicious Morrell Pride Bacon. This company is the oldest meat packing concern in the United States, with main offices in the heart of the corn belt. Their sausage and canned meats "go to town" in style.

John Morrell & Co. chose a Strathmore paper for their letterhead as a worthy representative of their quality products. Let a Strathmore letterhead paper speak for your product, too. The Strathmore watermark is your assurance of quality.

Strathmore Letterhead Papers: Strathmore Parchment, Strathmore Script, Strathmore Bond, Thistlemark Bond, Bay Path Bond, and Alexandra Brilliant.

STRATHMORE *MAKERS OF FINE PAPERS*

Strathmore Paper Company, West Springfield, Massachusetts

(*Continued from page 262*)

moment to analyze the nature of Mr. Purchasing Agent's job. He is employed by his company solely for the purpose of obtaining for his company the best possible supplies at the fairest possible prices. That is his only function. To do this work well he expects complete and accurate information to give him a proper background. He expects salesmen to know what they are talking about. He takes special note of salesmen who offer suggestions for savings and economies, and he will get respect and courtesy from salesmen — or he will see other salesmen, instead of the less considerate.

"The war is over and the purchasing agent is again a purchasing agent. Don't waste a single moment condemning him, criticizing him, or resenting him. Realize his responsibilities, treat him wth the respect due him, help in every way you can and you'll find he's your best business friend."

"FIREWARDEN" WASTE BASKET

Firewarden is the name of a new type all metal waste basket that combines beauty, utility and safety. It is roomy and attractive in a variety of colors and finishes. Should a carelessly tossed match, a lighted cigar or cigarette stub,

or ash start a fire, the double open lids cause carbon dioxide to accumulate in a manner that prevents oxygen reaching the flame. The fire is simply smothered out before it can get started. The basket is excellently adapted for homes, offices, institutions, ships, hotels, etc. Firewarden is manufactured by the Stratosol Corporation, 18 East 41st Street, New York 17, N. Y. Descriptive literature.

SYNTHETIC RUBBER SUPERIOR FOR INKING ROLLERS

Because of its ability to resist chemicals and oils in ink, synthetic rubber is superior to natural rubber for inking rollers, printing plates, press blankets and other rubber printing materials, according to C. A. Russ, printing material specialist of United States Rubber Company.

(*Continued on page 267*)

Copyright 1946, L C SMITH & CORONA TYPEWRITERS INC SYRACUSE 1 N Y

...which typewriter?

The scene is a draft board. The time is late 1940. The typewriter is a Smith-Corona, typing names like Farnsworth, Vavrineck and Hershberger on important little cards—hundreds, thousands of them. That same Smith-Corona, and others like it in many other draft boards, is still going strong today—over five years later. It's after usage like this that you begin to appreciate the sturdiness built into these fine, fast, modern typewriters.

Smith-Corona

Makers also of
Smith-Corona Portables

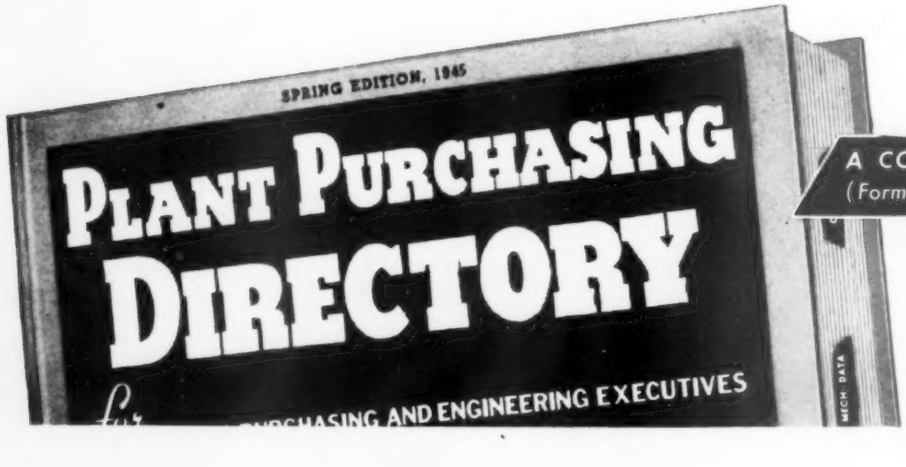
is there a

PLANT PURCHASING DIRECTORY

within your reach?

Most industrial buyers reach for PLANT PURCHASING DIRECTORY when they are looking for buying information as naturally as they reach for a pencil when they want to write.

They have found that the quick, easy and simple way of getting such information is by referring to the directory that is made up for their special needs . . . carries only industrial classifications . . . is comprehensive, compact, easy to handle and easy to consult. Keep it within your reach for ready-reference.



A CONOVER-MAST PUBLICATION
(Formerly Plant-Production Directory)

PLANT PURCHASING DIRECTORY
333 North Michigan Avenue
Chicago 1, Illinois

(*Continued from page* 264)

As a result of wartime research, the printing industry now has synthetic rubber products which will wear longer and produce better register than was ever possible with prewar natural rubber, said Mr. Russ. It is likely that natural rubber will never again be generally used for these products, he added.

"The principal difficulty with natural rubber," he said, "was that it had a tendency to swell when exposed to ink, throwing the printing out of register and causing deterioration of the rubber. One of the outstanding virtues of buna N and Neoprene synthetic rubbers is that they resist this swelling.

"The printing industry will use rubber on a greatly increased scale in the postwar world. This expansion will extend mainly to inking rollers and printing plates, both molded and engraved. Rubber plates have been found far superior for printing on cellophane, wax paper, fine stationery paper, box board, bags and other materials possessing a delicate surface easily cut or broken by metal plates. The use of synthetic rubber blankets will be a boon to printers because of the absence of swelling."

NEW STENOGRAPHERS CHAIR PROVIDES CORRECT POSTURE

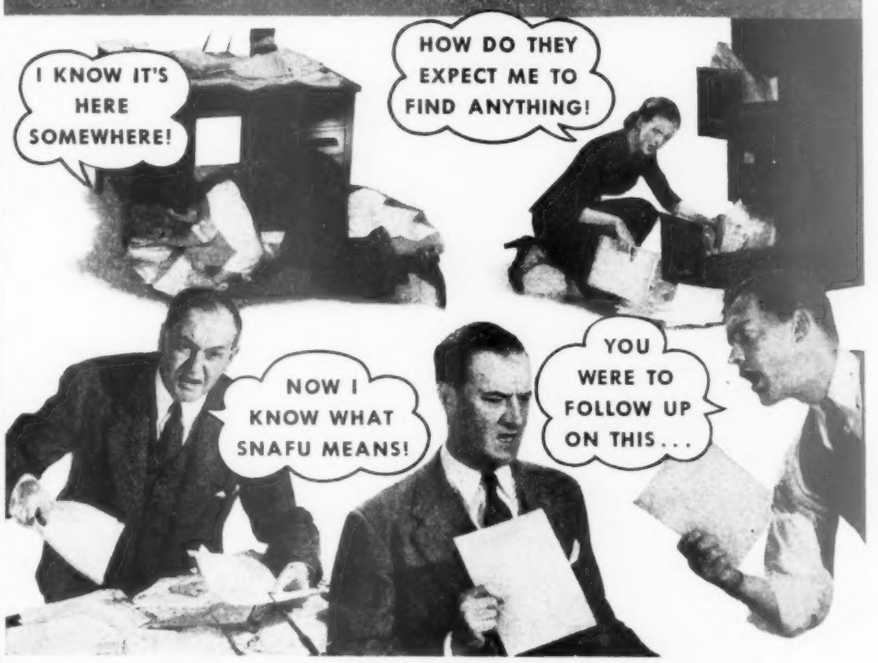
A new addition to its line of Posture Chairs for stenographers, executives and telephone operators, has been announced

by The Sturgis Posture Chair Co. of Sturgis, Michigan. The new addition is the Model 876-MY stenographers' posture chair illustrated.

New improvements provide correct posture without effort on the part of the occupant—adjustments for correct posture are made quickly without the use of tools. Correct posture minimizes fatigue, for increased office efficiency.

The chair is all steel construction. It has hard steel swivel mechanism-infrared baked on enamel finish in five colors. Large seats, and posture backs of rubberized curled hair covered with attractive leatherette in a choice of contrasting colors to blend with any office color scheme. Noiseless, easy gliding casters.

Is your office a reconversion muddle?



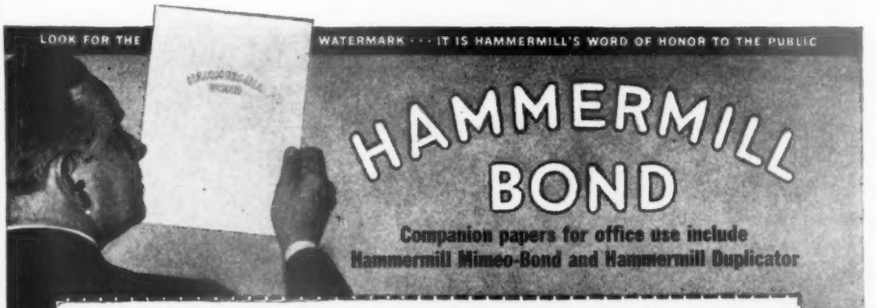
These two useful books will help . . .

Send for them—they're FREE!

Even if the change-over to peacetime conditions has not brought the headaches and confusion you feared, still you've undoubtedly found that some adjustment of personnel and procedure is necessary. If so, this may be an excellent time to give your office machinery a thorough check-up.

These two Hammermill books will help you there. "3 Steps that Get Things Done" shows how properly designed business forms check confusion and speed work. "How to Design a Business Form" provides a 26-point check list for analyzing forms, tells how to improve and control buying, select economical sizes. Send coupon.

Coupon below will also bring you the sample book of new Hammermill Bond showing how this fine paper has been improved since war's end.


LOOK FOR THE
WATERMARK · · · IT IS HAMMERMILL'S WORD OF HONOR TO THE PUBLIC
HAMMERMILL BOND
Companion papers for office use include
Hammermill Mimeo-Bond and Hammermill Duplicator

HAMMERMILL PAPER COMPANY, 1461 East Lake Road, Erie, Pa.
Please send me—free—copies of "3 Steps that Get Things Done" and "How to Design a Business Form" and include the sample book of new Hammermill Bond.
Name .....
Position .....
(Please attach to, or write on, your *business* letterhead) PU-FE

PERSONALITIES *in the* NEWS

M. R. Denison has joined Bendix Home Appliances, Inc., South Bend, Ind., as Purchasing Agent. With 32 years' experience in production and purchasing for automotive manufacturers, Mr. Denison

came to the home appliance manufacturer from the White Motor Co., Cleveland. He previously was employed in executive positions for 24 years by Studebaker corporation in Detroit and South Bend. In the Cleveland position he had charge of purchases in the unit division and during the war years he directed the purchase of all castings.

Fred O. Paige has been appointed Purchasing Agent of Welsbach Engineering and Management Corporation, Philadelphia, Pa., and all of its subsidiaries. He succeeds John F. McGough.

Covey Williams, Purchasing Agent, Wyatt Metal & Boiler Works, Houston, Tex., has retired to become a partner in the newly organized H. W. McCormick Company, suppliers of carbon steel plates, sheets and shapes, and alloy rounds. Offices of the new company are at 536 Maplewood Street, Houston.

Cal R. Wood succeeds Ralph D. Lane as Purchasing Agent for The Aetna

Standard Engineering Co., Youngstown, Ohio. Mr. Lane has established himself as manufacturers' agent for various products. Mr. Wood has been Assistant Purchasing Agent at Aetna Standard since 1937.

A. M. McHenry has been named Purchasing Agent and Storekeeper of the Gulf, Colorado & Santa Fe Railway with headquarters at Cleburne, Tex. He succeeds the late C. J. Irwin. Mr. McHenry entered the Santa Fe service as clerk in the general storekeeper's office at Topeka in 1919.

H. G. Bartels has been appointed Purchasing Agent of the St. Louis Southwestern Railway Company, St. Louis, Mo., succeeding the late H. G. Divine. He entered the employ of the Cotton Belt as clerk in the purchasing department in 1922, was made chief clerk of the department in 1939, and assistant purchasing agent in 1941.

Lewis A. Jones has been named Director of Procurement for Allied Control Co., Inc., 2 East End Avenue, New York, N. Y. Mr. Jones, who is well known in purchasing circles is a past president

of the National Association of Purchasing Agents, and also the Eastern New York and the New York City associations. He is the second recipient of the Shipman medal which was awarded to him in 1932. Mr. Jones formerly was Purchasing Agent for the Adirondack Power & Light Corp., Albany, N. Y., and Director of Purchases for the General Cable Company, New York City. He was called to Washington in the early days of the war, serving in the procurement division of WPA, and later in the procurement divisions of the Treasury Department. While in Washington Mr. Jones took active part in the affairs of the local association.

Roy H. Webb, Purchasing Agent for Templeton-Kenly & Co., Chicago, Ill., was recently elected president of the West Suburban Council, Boy Scouts of America. He has been a volunteer scout leader for the last 20 years. As president he will supervise the scouting work of 12 suburbs. He has been awarded the Scoutmaster's Key and the Silver Beaver for distinguished service.

Robert S. Hatch has been appointed Manager of the Purchasing Department of The Texas Company, New York, N. Y., succeeding Greer W. Orton who has become assistant to the president

Mr. Hatch has been with Texaco since 1927, and has been a member of the Purchasing Department since 1938.

Mr. Hatch, a native of Boston, was graduated from Massachusetts Institute of Technology in 1927 with a degree in civil engineering. In July of that year he was employed by the Texas Company and served in various capacities in the refining department until 1938 when he was transferred to the purchasing department. In 1939 he was named assistant to the manager, becoming assistant manager in 1943. In 1943 he was appointed chairman of the materials subcommittee for district One, Petroleum Industry Committee, and served in that capacity on a part time basis until the committee was dissolved in October 1945.

George D. Seguin succeeds Marcus W. White, retired, as Purchasing Agent for the Norton Company, manufacturers of abrasives and refractories, Worcester, Mass. Mr. Seguin began his Norton services in 1926 as a buyer, and for the past 15 years has been Assistant Purchasing

George D. Seguin

Agent. He is a past president of the Worcester County Purchasing Agents Club and a member of the New England Purchasing Agents Association. Previous to his connection with the Norton Company he was with the Brown & Sharpe

(*Continued on page 270*)

Still the GREATEST *Buy* in Drill History!

½ in. Special Duty

SKILDRILL

Model "80"

WEIGHS ONLY 8 LBS.

MUCH SMALLER SIZE

MORE COMPACT

GETS INTO TIGHT SPOTS

$48

● It's the lightest weight, most compact, easiest handling ½ in. drill made . . . and its outstanding performance is backed up by the finest quality in every detail. For instance, 100% anti-friction bearing construction . . . extra capacity motor . . . 100% overload capacity switch, helical cut gears of finest steel . . . die cast aluminum alloy body . . . and many other quality features. No wonder Model "80" SKILDRILL is still the *greatest buy* in drill history!

Ask for Model "80" SKILDRILL by *brand name* when you call your distributor.

SKILSAW, INC. 5033-43 Elston Ave., Chicago 30, Ill.

Factory Branches in All Principal Cities

PORTABLE• ELECTRIC

SKILTOOLS

MADE BY SKILSAW, INC.

● The above statement is typical of many reports received from safety directors and plant managers about CESCO'S improved face shield with the new plastic headgear.

FOUR GOOD REASONS
why this CESCO Shield gives better service:

1. **Durable**—the newly designed headgear is made of flexible, long-wearing plastic, which has proved more durable than other headgear materials.
2. **Clear, tough windows**—made of sturdy plastacele. An exclusive, simple method of attachment permits quick window replacement.
3. **Comfortable**—the flexibility of the plastic headgear and the simple adjustment to varying head sizes assure an easy, comfortable fit on every wearer.
4. **Clean and sanitary**—the plastic headgear does not absorb dirt or moisture, and is easily cleaned with a cloth.

4 styles available —Write today for literature and prices

CHICAGO EYE SHIELD CO.
2320 Warren Boulevard
Chicago 12, Illinois

CESCO
FOR SAFETY

(*Continued from page 268*)

Manufacturing Company and also the United States Finishing Company.

Mr. White has been with the Norton Company for 38½ years, joining the company in 1907, and 12 years later was

Marcus W. White, retired

made Purchasing Agent. He also was a member of the New England Purchasing Agents Association and quite active in it. He is one of the outstanding philatelists of the country, and the author of many articles on philatelic subjects.

Fred W. Ford has been appointed Purchasing Agent of the San Diego plant of the Solar Aircraft Co., succeeding W. L. Wilkinson, who is sales manager. Mr. Ford formerly was assistant purchasing agent of the Seversky Aircraft Corp., Farmingdale, L.I., N.Y., from April 1934 until June 1939, after which he was purchasing agent for the Stinson Aircraft Co. at Wayne, Mich., and Nashville, Tenn. Later he was affiliated with another San Diego aircraft company as sales engineer, purchasing agent and assistant to the vice president in charge of manufacturing. He first came to Solar as a contract administrator in September 1943, and was resident manager of the company's New York office from January 1st until October 1944 when he was transferred to the Des Moines plant where he was procurement director, and assistant to the works manager until he was transferred to San Diego.

Harold J. Jungbluth has been named Purchasing Agent of The Oilgear Com-

G. L. Hartman, resigned

pany, Milwaukee, Wis., succeeding G. L. Hartman, who has resigned to accept a position offering wider opportunities.

Ray L. Geiler, for the past eight years Director of Purchases for the A. R. Maas Chemical Co., Los Angeles, Calif., has been transferred to the position of sales manager. George Riley, his assistant for the past few years, succeeds him as Director of Purchases. Robert M. Vasseur succeeds Mr. Riley as assistant purchasing agent. Mr. Geiler joined the Maas Chemical Company as a research chemist and in 1937 organized the purchasing department.

Henry F. Woulfe, formerly Purchasing Agent of the Pepsodent Company, Chicago, Ill., has been named vice president and general manager. Mr. Woulfe joined Pepsodent in 1927 as Purchasing Agent, subsequently taking over plant operations, production and planning, and in 1943, was appointed vice president.

Raymond N. Nielsen, formerly Director of Purchases, The Parker Appliance Co., Cleveland, Ohio, has been named Eastern District Sales Manager for the Company with headquarters in New York City. He joined the company in April 1942, and previous thereto was assistant in the purchase division of the Atlas Powder Company at the Ravenna Ordnance plant.

George J. Steiner, formerly in the purchasing department of the Worden Allen Company of Milwaukee, Wis., has been named assistant to Fred G. Hoppe, Purchasing Agent for the Miller Brewing Company of that city.

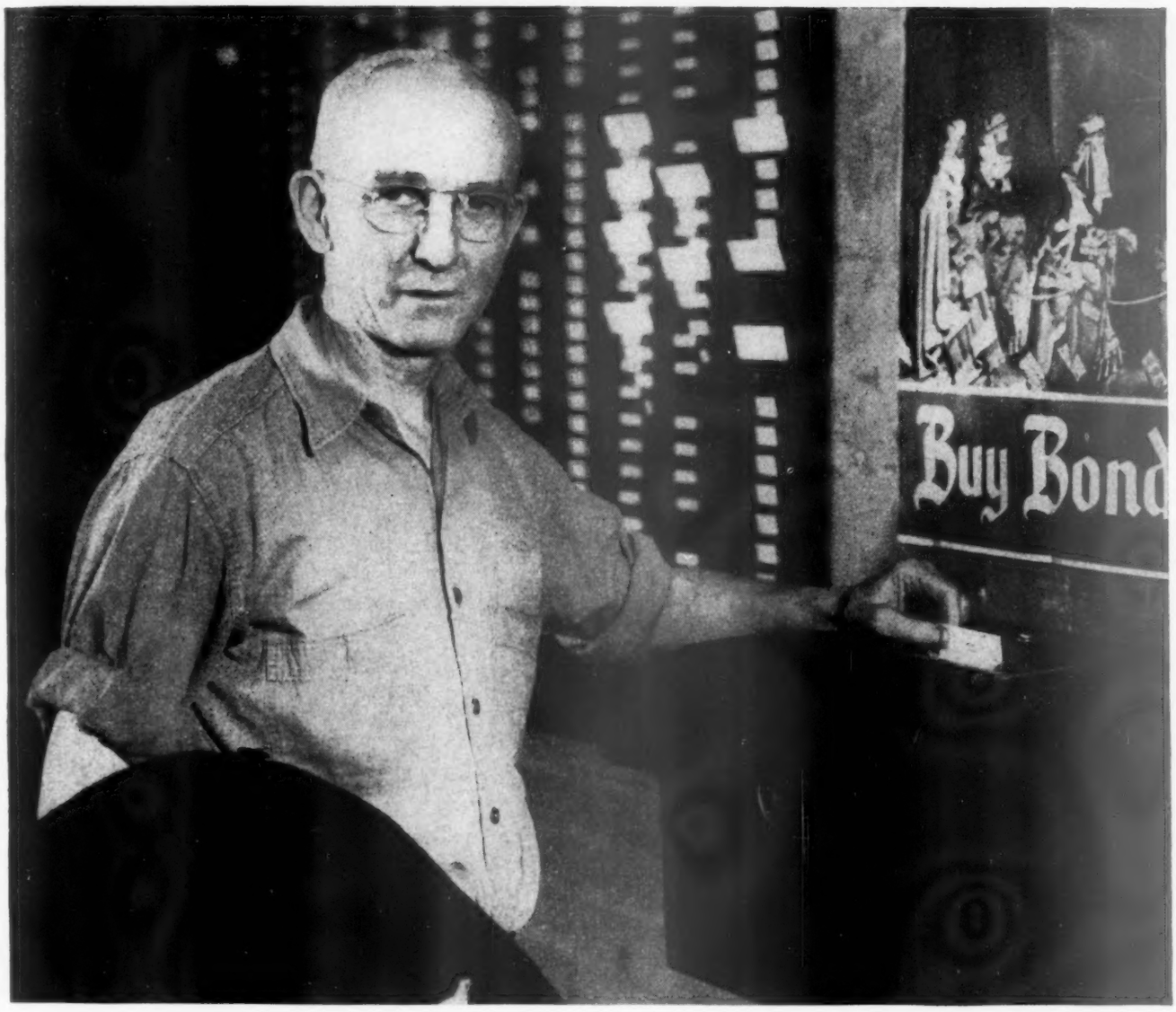
Paul M. Tintera, Purchasing Agent for Columbia University, New York, N.Y., has been appointed to a five-year term as member of the Municipal Housing Authority, Yonkers, N. Y.

George C. Furniss, Western Purchasing Agent for General Foods Corp., Battle Creek, Mich., and connected with the Post Products division since 1912, has retired.

Raymond F. Fricke succeeds Robert Murray, retired, as manager of the Purchasing Department for Zellerbach Paper Co., Seattle, Wash.

Brig. Gen. Albert J. Browning, on terminal leave from the Army Service Forces where he was Director of Purchases, has been appointed director of the new Office of Domestic Commerce, by Secretary of Commerce Wallace. General Browning is slated to become one of the three Assistant Secretaries of Commerce under Secretary Wallace's reorganization plan which will divide the department into three bureaus if Congress approves, namely, domestic commerce, small business, and foreign trade. Before going to Washington for war service, General Browning was merchandising manager for Montgomery Ward & Co., Chicago, and previously, had headed the United Wall Paper Factories, Inc., Chicago. He was made deputy director of the old Office of Production Management under Donald M. Nelson. When Mr. Nelson became production chief, he arranged for

(*Continued on page 274*)

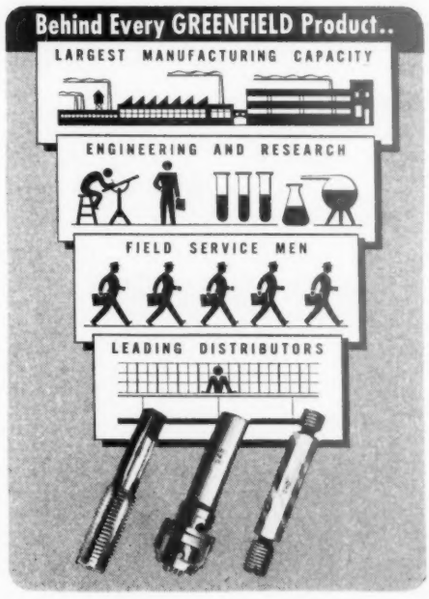


Not 62,940 hours for nothin'!

I figure I've punched in over 62,940 hours for GTD.

Maybe you fellows who buy threading tools don't realize it, but those hours mean something when you buy a tap, die or gage with the GTD mark on it. Those hours mean better workmanship—the result of years of learning by doing.

You might be interested to know that in the "Greenfield" organization there are 296 of us who have spent 20 years or more at our jobs—making high quality threading tools. *When you buy "Greenfield"—you buy precision. And precision takes practice.*



GREENFIELD

GREENFIELD TAP and DIE CORPORATION

GREENFIELD, MASSACHUSETTS

Henry H. Berke, Assistant Vice-President, Services of Supply, Pan American World Airways (left) discusses with Ralph D. Mount, Assistant Sales Manager of The Bassick Company, salient features of Bassick's new Position Lock used on portable airplane maintenance and production equipment.

"Make Sure the P. A. Knows Your Product!"

"One thing I've learned from 18 years of industrial selling," says Ralph Mount, Assistant Sales Manager of The Bassick Company, "is to make sure the P. A. knows our products. If you don't think it pays big dividends to keep Purchasing Agents fully informed on our products, you ought to see how much of our business, both new and repeat, is directly traceable to Purchasing Agent decisions or influence or both."

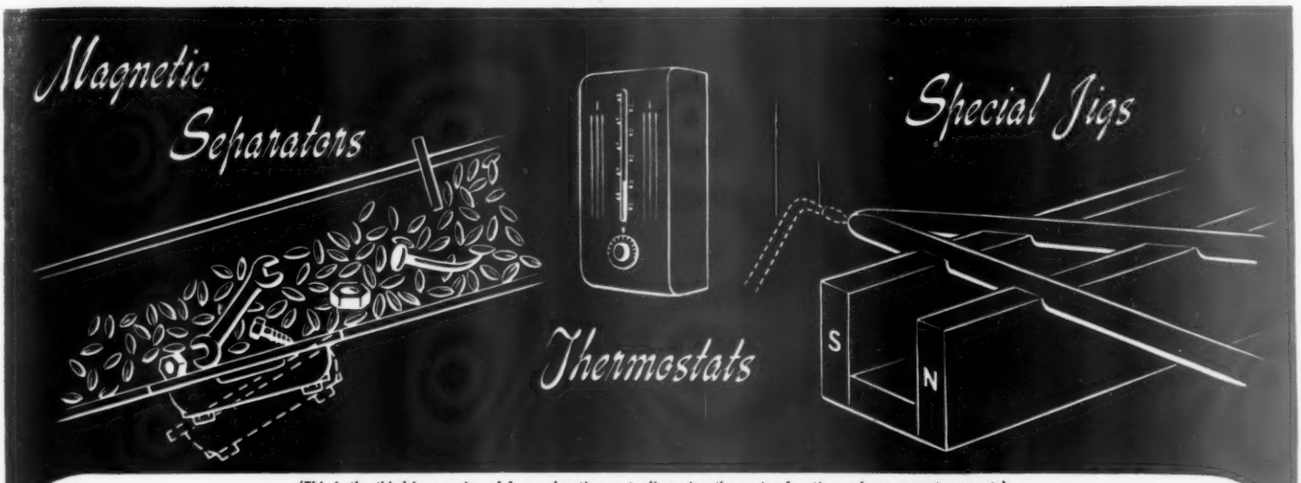
You can take Mr. Mount's word for it. The P. A. is a real power in today's industrial buying – a power that can be every bit as responsive to printed selling as it is to personal selling, if advertisers will bring out this responsiveness through the pages of PURCHASING, the purchasing agents' own business publication.

* * *

To inquire about rates, write PURCHASING, 205 E. 42nd St., New York 17, N. Y.; 333 No. Michigan Ave., Chicago 1, Ill.; Leader Building, Cleveland 14, Ohio; Duncan A. Scott & Company, West Coast Representatives, Mills Bldg., San Francisco 4, and Pershing Square Bldg., Los Angeles 13, Calif.

PURCHASING
ABC ABP
A CONOVER-MAST PUBLICATION

PERMANENT MAGNETS MAY DO IT BETTER



(This is the third in a series of four advertisements discussing the major functions of permanent magnets)

TRACTIVE EFFORT from PERMANENT MAGNETS

The power to attract magnetic materials led to the discovery of the lodestone—the earliest known form of permanent magnet. The same force has served mankind, since antiquity, in the compass. This tractive effort is now employed industrially in three ways.

1. *For holding and lifting magnetic materials.* Magnetic materials are held in place for assembly or other operations, by means of magnetic chucks or jigs. Magnetic separators extract tramp iron or other magnetic substances from non-magnetic materials. They function in such devices as coin selectors in vending machines.

2. *To produce tension*—replacing mechanical springs in various applications where tension in another form is required. This principle is used on thermostats, pressure controls, switches, and similar devices.

3. *To transmit motion without mechanical connections.* Permanent magnets can reproduce motion from one part to another through a seal—as in the flow meter and other packingless drives.

Indiana Steel is the largest exclusive manufacturer of permanent magnets, established for over 35 years. Without obligation, our engineers will be pleased to consult with you on any of your problems involving their possible application. Write for copy of technical booklet: "Permanent Magnets Have Four Major Jobs."

THE INDIANA STEEL PRODUCTS COMPANY

6 NORTH MICHIGAN AVENUE • CHICAGO 2, ILLINOIS

Specialists in Permanent Magnets Since 1910

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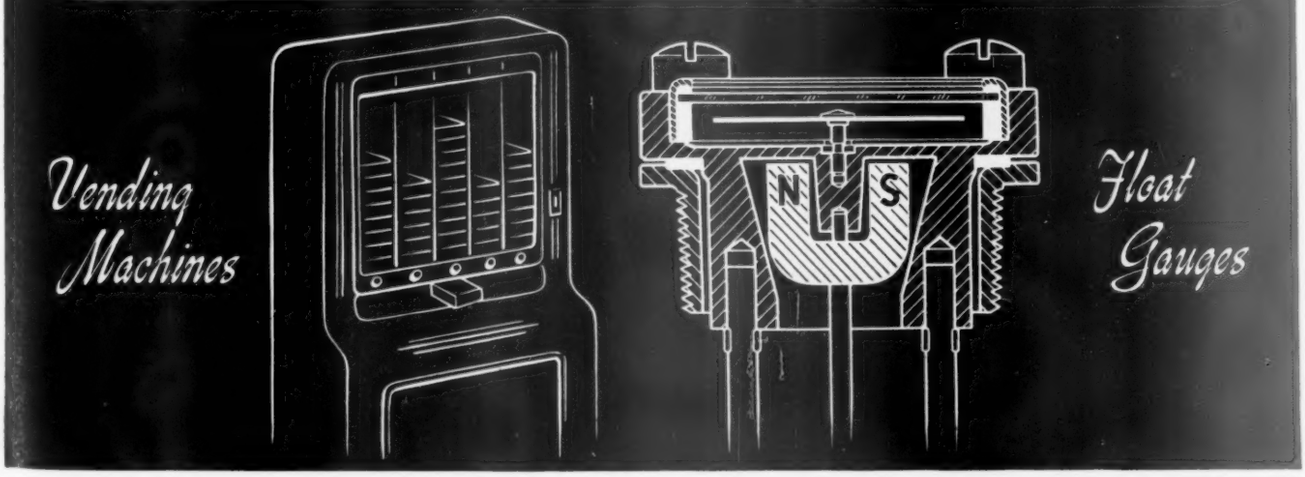
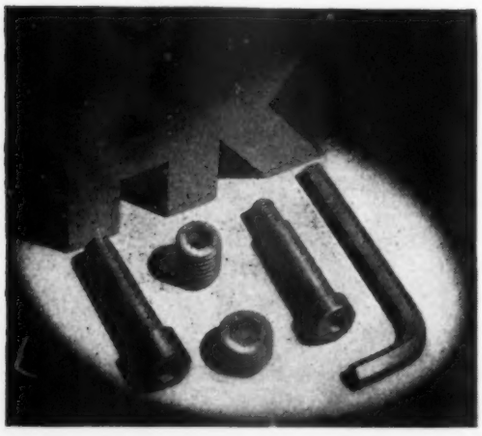


Etched, cutaway H-K Socket Head Cap Screw clearly showing Continuous Fibrous structure.

HOLO-KROME

fibro forged SOCKET SCREWS

A stronger screw! Continuous fibrous structure, uninterrupted, unbroken, unsevered in Socket Screws means only one thing — Holo-Krome FIBRO FORGED Screws. The method, patented and used exclusively by Holo-Krome, inherently has this continuous structure plus the increased strength imparted by the Holo-Krome method of Completely Cold Forging . . . Specify "Holo-Krome" and benefit by Completely Cold Forging — a stronger Socket Screw!



THE HOLO-KROME SCREW CORP. — SOCKET SCREW PRODUCTS — HARTFORD 10, CONN. U. S. A.

(*Continued from page 270*)

Browning's transfer to the War Department as part of his program of providing the armed forces with experienced civilian executives to direct purchases.

Howard C. Baker has been made Purchasing Agent for the J. Hungerford Smith Co., Rochester, N. Y. Previously he was Purchasing Agent for the Comstock Canning Company, Newark.

Charles P. Kelleher, recently discharged from the Army, has been reappointed Purchasing Agent for the city of Haverhill, Mass.

V. W. Bergenthal, executive officer of the Wagner Electric Corporation, St. Louis, Mo., a former Purchasing Agent of the company, retired on December 31st. A founder of the St. Louis Purchasing Agents Association, he served

as president the second year, and as a director for the first three years. He will continue to serve as a director of the Wagner company. He has been with Wagner for 41 years, since November 1, 1904, when he took his first position with the company as assistant sales manager. In 1913 he was appointed Purchasing Agent and served in that capacity until 1922. In January 1922 Mr. Bergenthal was elected a director, and in August 1922 he was elected treasurer.

Mr. Bergenthal, who was born in Milwaukee, Wis., received his A.B. degree from Marquette University in 1894, and graduated from the electrical engineering school of the University of Wisconsin in 1897, receiving his B.S.E.E. and E.E. degree in 1898 after a year's post-graduate work. After that he moved to Pittsfield, Mass., and began working for the Stanley Electric Manufacturing Co., moving to its Chicago branch in 1901 and to Wagner Electric three years later. He has been an associate member of the American Institute of Electrical Engineers for some forty years. He is succeeded by secretary J. D. Eby, who was elected secretary-treasurer.

Leroy D. Green recently retired as Assistant Purchasing Agent, Bethlehem Steel Co., Bethlehem, Pa. Mr. Greene, a native of Worcester, Mass., attended Phillips-Andover Academy, Andover, Mass. His first position was with the Boston Navy Yard. Later he joined the Fore River Shipbuilding Co., which is now the Quincy, Mass., yard of Bethlehem. Here he became assistant to the purchasing agent, six years later being

(*Continued on page 276*)

No doubt grandfather felt that the world of ninety years ago was pretty wonderful . . . even though there were no radios, no automobiles, no electricity, no airplanes, no home appliances — nor any of the things which typify modern utility and comfort . . .

But there were good shipping boxes and crates. Rathborne, Hair and Ridgway was making them then—just as they are making SUPERSTRONGS today . . .

And SUPERSTRONGS—"Bound with Steel"—are the result of ninety years of "know how" in better box construction and design.

SHIPPING TRADE SUPERSTRONG MARK CONTAINERS REG. U.S. PAT. OFF.

RATHBORNE, HAIR AND RIDGWAY COMPANY

1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

RIEGEL WORK GLOVES

These strong, protective work gloves are the product of one of America's largest textile mills. They are Riegel-controlled—in one plant—from raw cotton to finished glove. This single close supervision of every detail results in unexcelled quality—durability—economy.

"The Right Glove Riegel *For Every Job"*

RIEGEL TEXTILE CORPORATION

342 Madison Avenue, New York 17, N. Y.

(*Continued from page* 274)

sent to Bethlehem where he was made assistant purchasing agent some six years ago.

His chief activity has been the purchase of scrap. During the war he served on the WPB Scrap Advisory Committee and is a member of the OPA scrap Advisory Committee. He returned recently from a tour of Europe and England as a member of the Overseas Scrap Committee of the U. S. War Department. He is a member of the scrap committee of the American Iron & Steel Institute and the American Tin Trade Association. Recently he purchased scrap from the U.S.S. Raleigh, light cruiser, demolished at the Philadelphia Navy Yard, for whose construction he purchased materials at the Bethlehem Quincy Yard in the 1920's.

Ferdinand H. Rhoden, head of Burlap Purchasing for the Chase Bag Company, Chicago, Ill., is in Indiana investigating current jute and burlap conditions. On his return he will stop by London and

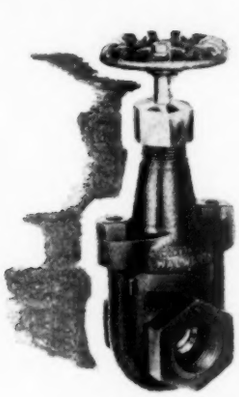
Dundee. His association with the burlap industry dates from 1907. During the war he was executor of Burlap Order M-47, War Production Board. He joined Chase Bag Company in May 1944 to handle burlap purchasing. Prior to joining the WPB he was associated with the Ludlow Manufacturing & Sales Co., and before that was manager of the East India Department of W. R. Grace Company.

Brig. General William I. Rose, recently returned from the Southwest Pacific where he was awarded the Legion of Merit for outstanding service as Army commander at Efate and Espiritu Santos, New Hebrides, has been appointed Purchasing Agent for the city of Boston, Mass.

Henry M. Schiller was recently appointed head of the Purchasing Department of S. Stroock & Co., Inc., New York. He recently was released from the Army as a lieutenant colonel following 21 months overseas. Prior to 1941 he was a civilian administrative officer for the War Department.

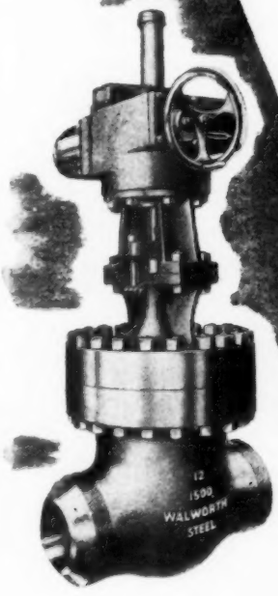
L. J. Wurm is Purchasing Agent for the Asco Corp., Cleveland, Ohio, manufacturers of electronic, mechanical and electrical parts for the radio, phonograph and television industries. He

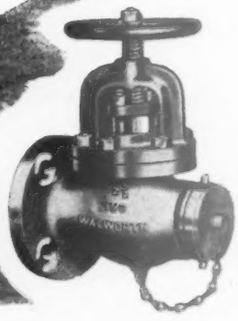
(*Continued on page* 278)

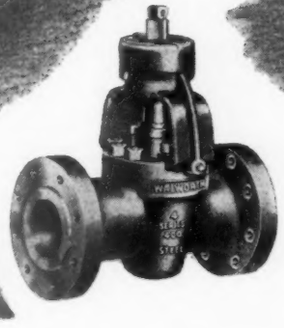


Walworth . . .

MANUFACTURERS OF QUALITY VALVES AND PIPE FITTINGS FOR 104 YEARS







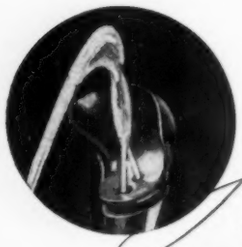
In the Walworth line there's a valve for every job, engineered to assure maximum economy of operation and trouble-free performance. Each Walworth valve has ALL the latest features of advanced design that are required for the service for which the valve is recommended.

Walworth Catalog 42 gives full information on the Walworth complete line of steel, iron body, bronze and lubricated plug valves, as well as a complete line of fittings. Your copy may be obtained upon request. Write for it today.

Walworth VALVES AND FITTINGS

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



Health Safety

IMPORTANT FACTORS IN PROMOTING PRODUCTION

Efficiency

You can't have production running smoothly without your equipment and personnel being at par. One of the most important steps in efficiency is strategically placed drinking water. Workers feel refreshed, do their work better, and save steps where handy, health-safe Halsey Taylor Drinking Fountains are installed. Distinctive features that safeguard health and promote better working conditions . . . write for catalog!

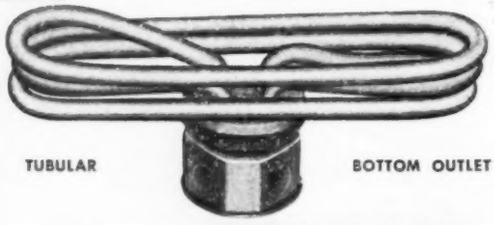
THE HALSEY W. TAYLOR CO., Warren, O.

HALSEY TAYLOR

DRINKING FOUNTAINS

F-1

TRADE VULCAN MARK



TUBULAR BOTTOM OUTLET

This VULCAN HEATING ELEMENT

has proved efficient and economical in

COFFEE URNS
STEAM TABLES
STERILIZERS
WATER HEATERS
AND SIMILAR ARTICLES

If you have a problem involving Electrical Heating Units, write us.

VULCAN ELECTRIC COMPANY

DANVERS 1, MASS.

Makers of a wide variety of Heating Elements for assembly into manufacturer's own products and of Heating Specialties that use electricity.

(*Continued from page 267*)

formerly was connected with Black Industries, Inc.

George McShane has been appointed Purchasing Agent for the American Felt Company, Glennville, Conn.

Joseph A. Hickernell has been named Assistant Director of Purchases, Harris-Seybold-Potter Co., Cleveland, Ohio. He has been with the company for three and a half years as a buyer.

Ivan Jenkins has been appointed comptroller and Director of Purchases, Paul F. Beich Co., Bloomington, Ill. He joined Beich in 1930 as an accountant, and was made purchasing agent and chief cost accountant in 1941.

Wm. A. Robinson, buyer, Revere Copper & Brass Inc., Dallas Division, Chicago, Ill., was awarded first prize in competition sponsored by the Purchasing Agents Association of Chicago, entitled "Evaluating the Procurement Function." The award was a $100 U. S. Victory Bond. George J. Mahoney, Purchasing Agent for the *Chicago Sun* was awarded a $50 Victory bond as second prize winner.

Franklin Fells, former Purchasing Agent for Seattle General Hospital, Seattle, Wash., has been named business manager for Firland Sanitarium, where he will also handle the purchasing.

J. F. Waite, commissary agent, has been appointed Assistant to Purchasing Agent of the N. C. & St. Louis Railway, Nashville, Tenn., in addition to his duties as commissary agent.

Curtis B. Bayer has been named Purchasing Agent of the Lackawanna & Western Railroad, New York, succeeding Russel E. King, retired.

J. H. Libenthal, Purchasing Agent of the Monon Railroad, Chicago, Ill., has retired after more than 55 years of service.

Fred Esser, Purchasing Agent of the Bryant Electric Co., Bridgeport, Conn., has been transferred to the Westinghouse Lamp Division, Bloomfield, N. J.

John W. Johnston succeeds W. S. Morse as Purchasing Agent for the Atlas Powder Company, Wilmington, Del., the latter having retired.

Col. Frank J. Atwood, for the past three and one half years chief of the Rochester Ordnance District, Army Service Forces, has been named Director of Purchases for Remington Rand Inc. and its subsidiary companies. Col. Atwood assumed his new duties on December 17th with headquarters at the company's New York offices, 315 Fourth Avenue.

Remington Rand's new director of purchases has just retired from active army service after having been a commissioned officer in the United States Army since 1916. Born in Bradford County, Penna., he was graduated from

(*Continued on page 280*)

N·B·M SILVER BABBITT FOR HEAVY PRESSURE

By alloying silver with lead, we produced a babbitt metal that remains stable under high speeds and heavy loads. During many years of gruelling wartime service it has proved its qualities:

- High Anti-frictional Qualities
- Ease of Bonding
- Retention of Hardness at High Temperatures
- Resistance to Squeezing Out
- Embedability
- Ease of Handling
- Resistance to Corrosion

Give N-B-M Silver Babbitt your toughest test. It will stand up to it.

NBM

NATIONAL BEARING DIVISION

ST. LOUIS • NEW YORK

AMERICAN Brake Shoe COMPANY

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

No charge

FOR THE

EXTRA SAFETY

—in TAYLOR MADE CHAINS

Taylor Made Alloy Steel Sling Chain is used extensively throughout the steel industry for it has twice the safe working load of low carbon steel or wrought iron chain. Every link is carefully inspected and every chain thoroughly tested before it leaves the factory. That's why it's fast becoming a *must* with production men everywhere who demand safety from chain. And there's no charge for this extra Taylor Made safety. Write today for literature or phone your mill supply distributor.

ARMY E NAVY

ESTABLISHED 1873

S. G. TAYLOR CHAIN CO.

BOX 509 P-2 • HAMMOND, INDIANA

(*Continued from page 278*)

Washington State College and the University of Michigan, continuing his education with graduate work at the University of Michigan and at the Massachusetts Institute of Technology.

Colonel Atwood was commissioned a second lieutenant in the Coast Artillery Corps in 1916, served in France as an artillery officer during World War I, and later with the Army of Occupation in Germany. Upon his return from

F. J. Atwood

foreign service he was assigned after special training to the Ordnance Department. He has served on the staff of the Assistant Secretary of War and the staffs of two Commanding Generals as well as on the staff of the Chief of Ordnance. He is a graduate of the Army War College and the Army Industrial College and has been an instructor in the Army Industrial College.

Colonel Atwood's broad army experience earned him the important assignment in June 1942 as Chief of the Rochester Ordnance District, one of thirteen in which the United States is divided. In this capacity he was responsible for the development, purchase, production, inspection and shipping of war materials measured in terms of billions of dollars.

AMONG THE COMPANIES YOU BUY FROM

Kropp Forge Company, Chicago, Ill. Foley & Co., 15 Park Row, New York has been named sales representative in the eastern territory. The return of Charles Foley from overseas service reinstates the pre-war sales structure, which includes the services of W. M. Sears, who carried on during the emergency.

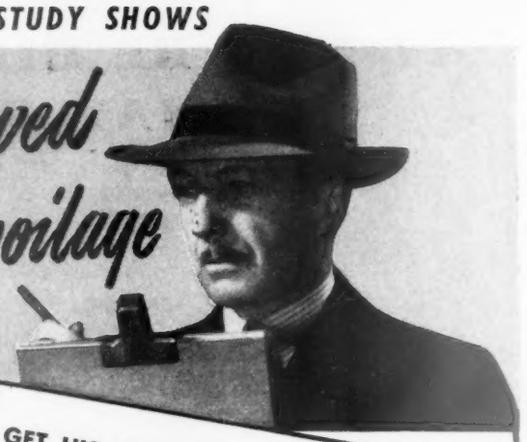
Wagner Electric Corp., St. Louis, Mo. F. G. Wilson, formerly a salesman at Dallas, has been appointed manager of the Indianapolis branch. H. F. Zahn, formerly manager of the Atlanta branch, has been made manager of the Philadelphia branch. C. G. Jackson, formerly manager of the Boston branch, has been moved to Atlanta to manage that branch. J. K. Miller, heretofore a New York branch salesman, has taken over the management of the Boston branch.

Elgin National Watch Co., Aurora, Ill. R. F. Waindle, formerly manager of industrial sales for the Sapphire Products division, has been appointed general sales manager.

(*Continued on page 282*)

INDEPENDENT INVESTIGATOR'S STUDY SHOWS

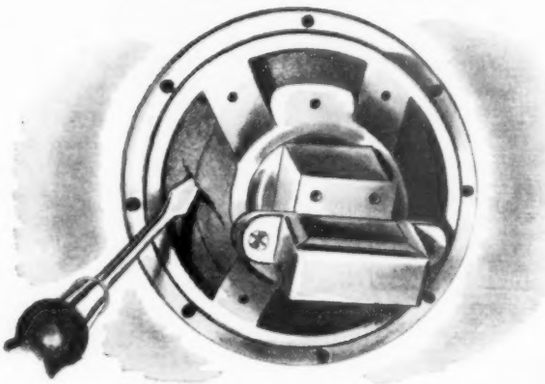
How Phillips Screws Saved Emerson Radio $40 Daily Spoilage



THIS INVESTIGATOR from James O. Peck Co., industrial research authorities, is visiting a number of representative plants to get authentic FACTS on assembly savings for you.

GET HIS UNBIASED REPORTS READ THE COMPLETE FACTS!

100 Driver Skids a day eliminated ... at 40¢ a skid!

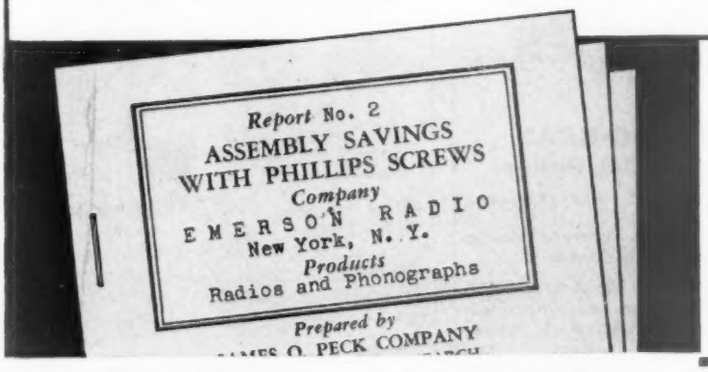


EMERSON RADIO & PHONOGRAPH CORP. use Phillips Screws for one good reason... *they cut costs!* Good example is the daily saving of $40 formerly used up reclaiming loud speaker cones ruined by driver skids from slotted screws.

That's only one way Phillips Screws save. They can be driven faster – allow use of power in place of hand drivers. They drive tighter – fewer and smaller screws can often be used. Burrs and broken screw heads are eliminated, and the ornamental design improves product appearance.

NOW, THESE UNBIASED REPORTS show how these advantages result in savings that add up *big* in yearly assembly records – savings you can't afford to miss with today's squeeze on profits.

THE ASSEMBLY STUDIES COVER ALL TYPES OF PRODUCTS – metal, plastics, wood. The report on Emerson – others now ready – and more to come – make up a practical manual of modern assembly methods, never-before-printed information, inside facts you'd pay good money to get, – and it's yours, now, FREE!



WHATEVER YOU MAKE, THERE ARE SAVINGS IDEAS HERE FOR YOU!

Find out how industry's best assembly experts cut costs! Get these reports, as they are issued. Don't wait... mail the coupon TODAY!

PHILLIPS *Recessed Head* SCREWS

Wood Screws • Machine Screws • Self-tapping Screws • Stove Bolts

27 SOURCES

American Screw Co.
Atlantic Screw Works
Atlas Bolt & Screw Co.
Central Screw Co.
Chandler Products Corp.
Continental Screw Co.
Corbin Screw Corp.
Elco Tool & Screw Corp.
General Screw Mfg. Co.
The H. M. Harper Co.
International Screw Co.
Lamson & Sessions Co.
Manufacturers Screw Products
Milford Rivet and Machine Co.
National Lock Co.
National Screw & Mfg.Co.
New England Screw Co.
Parker-Kalon Corp.
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Shakeproof Inc.
The Southington Hardware Mfg. Co.
The Steel Company of Canada, Ltd.
Wolverine Bolt Co.

PHILLIPS SCREW MFRS.,
c/o Horton-Noyes
2300 Industrial Trust Bldg., Providence, R. I.

Please send me the reports on Assembly Savings with Phillips Screws

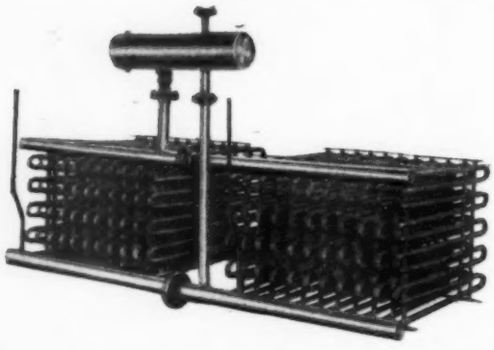
Name .....

Company .....

Address .....

.....

IT MAY BE BIG..
IT MAY BE SMALL



Regardless of the size and type of bend required in your installation, Swan specialized experience in bending, coiling and fabrication of piping and tubing offers you skilled engineering service, precise manufacturing facilities, and economical handling of the job from blueprint to on-time delivery.

We are prepared to submit designs, specifications and estimates on intricate coils and bends in any of the standard metals or alloys.

SWAN ENGINEERING CO., Inc.
12-58 Nelson Street
Bloomfield N. J.

AMERICAN
CORDAGE PRODUCTS

A Complete Line

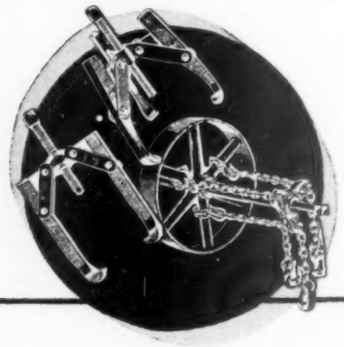
ROPE—TWINE—OAKUM—PACKING

AMERICAN MAKES GOOD ROPE

AMERICAN MANUFACTURING CO.
Brooklyn 22, N. Y.

Branch Factory:
ST. LOUIS CORDAGE MILLS, St. Louis 4, Mo.

Sales Offices: BALTIMORE • BOSTON • CHICAGO
HOUSTON • NEW ORLEANS • PHILADELPHIA



ARMSTRONG-BRAY
Gear and Wheel Pullers
Prompt Shipment

Save hours of time, prevent costly breakage and long shut downs.

STEELGRIP Standard Rigid Arm Gear and Wheel Pullers are of improved design. Will not slip from work. Arms are forged and heat-treated. 2-arm, 3-arm and special designs. 34 types and sizes.

CHAINGRIP Universal Pullers pull wheels, solid gears, pinions, etc., even at considerable distance from end of shaft. Proof-tested chains have both chain hooks and special pulley hooks. 3-ton and 12-ton capacities.

WRITE FOR CATALOG SHEETS

ARMSTRONG-BRAY & CO.
"The Belt Lacing People"
5378 Northwest Highway, Chicago 30, U. S. A.

(*Continued from page* 280)

Continental Can Co., Atlanta and New York districts. H. F. Campbell, formerly representative in the New Orleans district, has been appointed general line district sales manager with headquarters at Atlanta. Leonard Cannella and L. C. Bohs have been named assistants in the New York district. R. S. Hatfield is now assistant to sales manager of packers cans in the eastern district, and George Dohn has been made sales office manager of the New York office.

C. M. Hall Lamp Co., Detroit, Mich. H. S. Walker has been named manager of the Radiant Heat division. He re-

H. S. Walker

places T. P. Cusack, Jr., newly appointed manager of the sales development division of the entire company.

General Electric Co., Buffalo office. Major T. C. Ohart, a veteran of almost five years service in Army Ordnance, has returned to Empire Sales district of the Lamp Department as district engineer.

Link-Belt Co., Chicago, Ill. Joseph W. Sears, previously district sales engineer in Dallas, has been transferred to Hous-

J. W. Sears

S. Penick

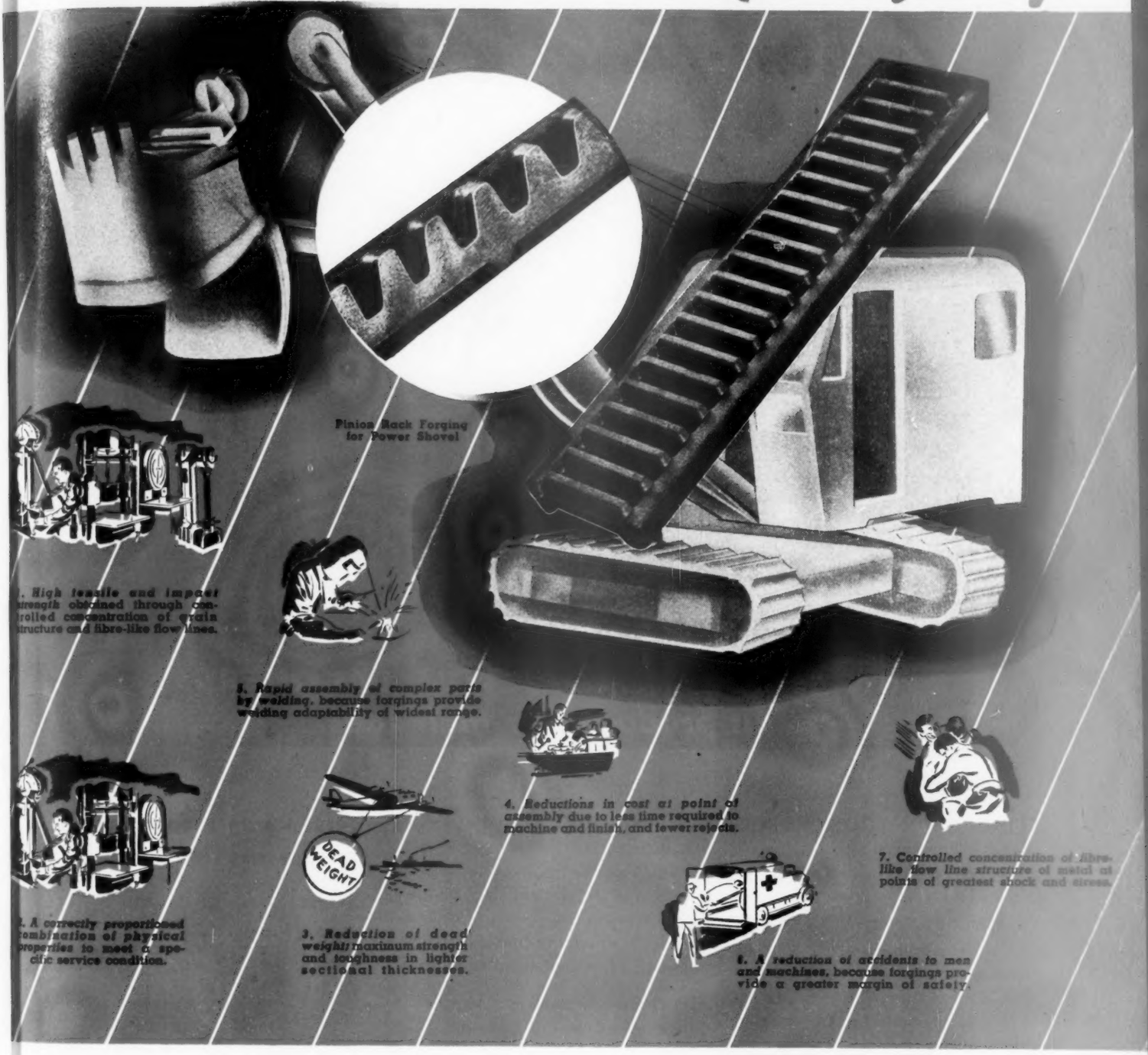
ton as district sales manager. Stuart Penick has been named district sales engineer at Dallas to fill the vacancy created by Mr. Sears' new appointment.

Page Steel and Wire Division of American Chain & Cable Co., Monessen, Pa. office Captain V. H. Gorfrey, who recently completed a tour of service in the United States Navy, has returned as sales engineer.

Lodge & Shipley Machine Tool Co., Cincinnati, Ohio. Rudel Machinery Co., 532 Statler Building, Boston, Mass., has been appointed exclusive dealer in the New England territory.

(*Continued on page* 286)

MAXIMUM METAL QUALITY ISN'T ALL THAT YOU GET IN .. *Forgings*



1. High tensile and impact strength obtained through controlled concentration of grain structure and fibre-like flow lines.

2. A correctly proportioned combination of physical properties to meet a specific service condition.

3. Reduction of dead weight maximum strength and toughness in lighter sectional thicknesses.

4. Reductions in cost at point of assembly due to less time required to machine and finish, and fewer rejects.

5. Rapid assembly of complex parts by welding, because forgings provide welding adaptability of widest range.

6. A reduction of accidents to men and machines, because forgings provide a greater margin of safety.

7. Controlled concentration of fibre-like flow line structure of metal at points of greatest shock and stress.

Buyers of your equipment expect two things of it: that it will perform up to their expectations; that it will operate efficiently under whatever unusual service condition exists in the case of a particular user. *In forgings, metal quality can be developed to the exact degree required to meet a specific service condition.* A product fortified with the metal quality found in forgings outperforms other products. Forgings offer many advantages beyond those called for in the specification. A recheck of every stressed part, as well as simple handles and levers, against the advantages that forgings offer usually reveals opportunities to improve the performance of a product, to lessen weight, to reduce cost on machining and finishing, to speed up assembly. Consult a forging engineer while the part is in the design stage. He will show you how maximum metal quality is developed by forging and guide you in utilizing correct forging techniques to obtain the utmost of every advantage that forgings offer you.

DROP FORGING ASSOCIATION
605 Hanna Building • Cleveland 15, Ohio

☐ Booklet on "Metal Quality—Hot Working Improves Properties of Metal."

☐ "Drop Forging Topics," issued at 60 day intervals.

Name ..... Position .....

Company .....

Address ..... City ..... State .....

DROP FORGING ASSOCIATION

605 HANNA BUILDING • CLEVELAND 15, OHIO

"Custom-Tailored" Protection...

UNICHROME PROTECTIVE LACQUERS
fit products for their jobs

THE COMBINATION OF PROPERTIES you get in Unichrome Lacquers results in protection *tailored to the job* . . . gives your product a definite competitive "edge."

Maybe your problem is *one* of those listed at the right—or any combination of them. Turn to Unichrome organic coatings for the formulation that achieves the desired protection . . . and is easy and economical to use.

There's a Unichrome Lacquer to fit your product not only for service conditions, but for your production set-up too. No cost-boosting operations need be introduced . . . whether you're protecting small, consumer goods . . . or adding corrosion resistance to large, industrial equipment.

Unichrome lacquers and synthetics are supplied clear or pigmented; for air-drying, or baking. We'll be glad to make recommendations for your special applications.

THERE'S A UNICHROME ANSWER TO PROBLEMS LIKE THESE...

Abrasion
Outdoor Exposure
Perspiration
Light
Marring
Salt Spray
Chrome-tanned Leathers
Humidity
Sulfides
Heat
Chemicals such as alcohols, alkalies, oil, grease, food stains, etc.

Unichrome Lacquers

PRODUCTS OF **UNITED CHROMIUM** INCORPORATED

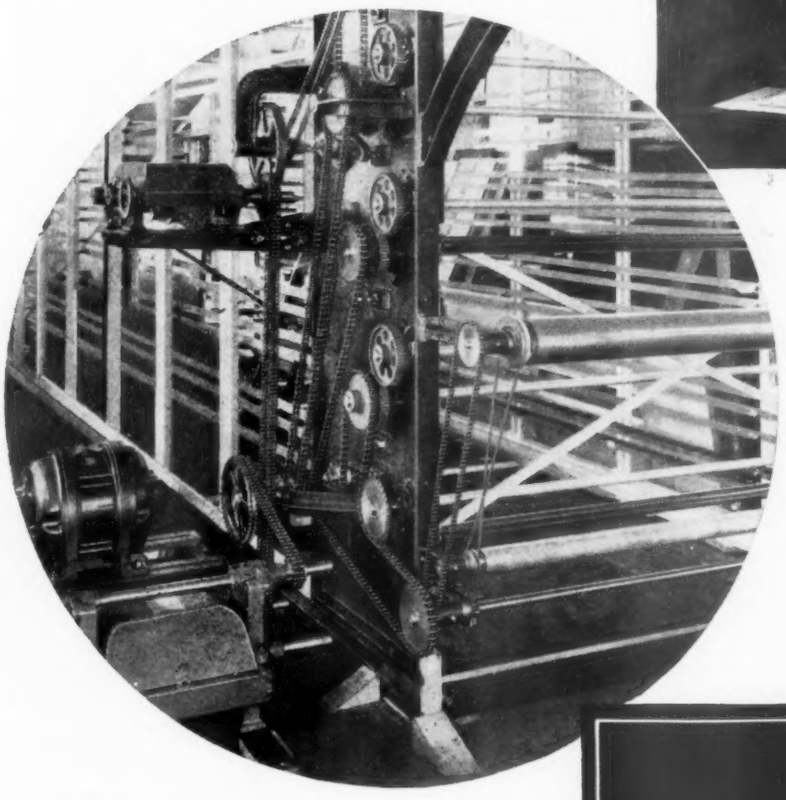
51 East 42nd Street, New York 17, N. Y.• Waterbury 90, Conn. • Detroit 7, Mich. • Chicago 4, Ill. Dayton 2, Ohio

OTHER U. C. PRODUCTS AND PROCESSES: Chromium Plating • Porous Chromium • *Unichrome Alkaline Copper *Unichrome Strip • *Anozinc Compounds • *Unichrome Rack Coatings • *Unichrome Stop-Off Lacquers and Compounds *Unichrome Dips • *Ucilon Protective Coatings

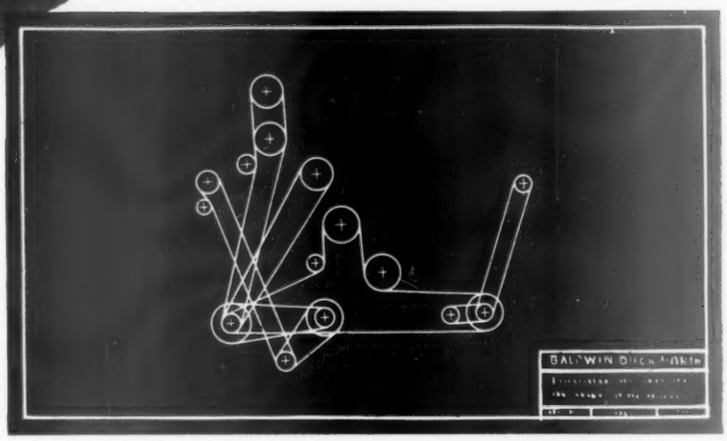
*Trade Mark Reg U.S. Pat. Off.

HERE'S THE LONG *and* SHORT OF POSITIVE POWER

① LONG CENTER DISTANCES or short, Baldwin-Rex roller chain belts are equally efficient. They transmit smooth, positive power . . . accurately time operations to the split-second regardless of center distances.



② THIS CONTINUOUS SHRINKING machine, for example, takes advantage of the ability of Baldwin-Rex roller chain belts to deliver positive power. No worries here about slipping or faulty timing. Baldwin-Rex transmits every ounce of power . . . smoothly. There's no need for frequent adjustment . . . no constant maintenance problem . . . no hazard from static electricity.



③ AS INDICATED on this plan of the shrinking machine drive, Baldwin-Rex roller chain belts can be used on both long and short centers . . . with equal efficiency. They are highly shock absorbent . . . quiet in operation and not dependent on set distances between centers for effective and proper operation. For the best in power transmission or timing, rely on Baldwin-Rex.

For catalogs on Baldwin-Rex roller chain belts or competent information on your specific drive problems, write to **BALDWIN-DUCKWORTH** *Division of* **CHAIN BELT COMPANY,** *366 Plainfield Street, Springfield 2, Mass.*

BALDWIN-REX *ROLLER CHAIN BELTS*

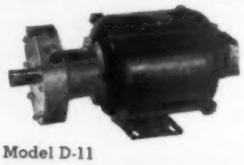
Baldwin-Duckworth Division, Springfield 2, Massachusetts • Rex Chain Belt Division, Rex Conveyor and Process Equipment Division, Milwaukee 4, Wisconsin

2 EASTERN CENTRIFUGAL PUMPS

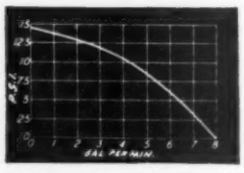
. . . for wholly different applications

MODEL D-11 is a ruggedly constructed general purpose centrifugal model designed for continuous duty under hard usage. Its availability with motors of various frame enclosures and current specifications makes it readily adaptable over a wide range of pumping applications.

Motor is a ⅛ H.P. heavy duty General Electric, induction type. Semi-enclosed motors are recommended for general service where hazardous or corrosive conditions do not exist. Totally-enclosed motors are furnished for locations where the unit is exposed to dust fumes, or spilled solutions. Explosion Proof motors (Underwriters approved Class I, Group D) are available for use under hazardous conditions. All can be supplied with sleeve or ball bearings. Available with either stuffing box or rotary seal.

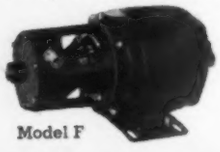


Model D-11

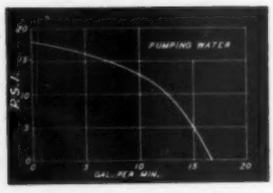


SIZE: 10¾" x 5" x 5½"
WEIGHT: 20 lbs. POWER: ⅛ H.P.
ALLOYS: Available in Cast Iron, Bronze, Stainless Steel, Monel Metal and Hastelloy C.

MODEL F is a heavy duty centrifugal pump designed for continuous operation in applications requiring sizeable volumes or pressures with a minimum expenditure of size and weight. Powered by a General Electric induction motor for long, silent, trouble free operation. Available with either stuffing box or mechanical rotary seal. All motor enclosures, including explosion proof Class I, Group D, are available.



Model F



SIZE: 11½" x 6½" x 6¾"
WEIGHT: 35 lbs. POWER: 1/3 H.P.
ALLOYS: Available in Cast Iron, Bronze, Stainless Steel, Monel Metal and Hastelloy.

If you need small, highly efficient pumps for industrial uses, Eastern has over 600 variations for your application or will be pleased to design and produce one to meet your specific needs when a reasonable quantity is involved.

EASTERN ENGINEERING COMPANY

61 FOX ST., NEW HAVEN 6, CONN.

(*Continued from page* 282)

Blaw-Knox Co., Washington area. Robert T. Harris, formerly vice president in charge of the construction department of the Blaw-Knox division, has been elected president of the Matt A. Doetsch Machinery Co., Washington, which has represented the Blaw-Knox Company in the sale of construction machinery for some years, and will continue this representation.

Ohio Stainless Co., Cleveland, Ohio. Allen Hurt has joined the company as

Allen Hurt

sales manager. He was formerly associated with the Federal Telephone & Radio Co.

Baldwin Locomotive Works, Chicago office. B. A. Springer, hydraulic press and power tool engineer, has become a sales engineer in the Southwark division, and will specialize in hydraulic presses.

Blaw-Knox Co., Power Piping Division, New England district. Flagg, Brackett and Durgin, Boston, Mass., have been appointed sales representative in the New England states.

American Welding & Manufacturing Co., Warren, Ohio. H. D. Malone, formerly midwestern sales manager has been named assistant sales manager.

A. M. Byers Co., Atlanta office. J. A. Cain has been appointed manager of the new divisional office to serve a five-state area, with office at 817 William Oliver Building.

Northrop Aircraft, Inc., Hawthorne, Calif. F. W. Jones has been named manager of the Light Metal Products Division.

Sawmill Manufacturing Co., Michigan area. J. E. McFate, formerly associated with Republic Supply Co., Houston, has been named sales representative.

American Central Manufacturing Corp., Fort Worth office. L. W. Evans has been appointed southwestern district sales manager.

Norton Company, Los Angeles office. H. A. Blackburn has been appointed refractories engineer for the Pacific coast with headquarters in Los Angeles. Mr. Blackburn has been with the company for over twenty years. His former territory in Ohio, Michigan and Kentucky, will be covered by L. S. Weber, Jr. from the Dayton office.

Norton Company, Erie, Pa. office. J. L. Moser has been appointed abrasive engineer for northwestern Pennsylvania and southwestern New York with headquarters in Erie. He succeeds R. W. Crawford who has become president of the Erie Manufacturing and Supply Co.

Shell Oil Company, New York division. Lieutenant Commander Selwyn Eddy, who has been on military leave since July, 1942, has returned to civilian life and will become manager of the marketing division. Ralph Carey, who served as acting manager of the division during the war, has been named assistant manager. The division comprises the New York metropolitan area, New Jersey, and part of Connecticut.

Watson-Stillman Company, Roselle, N. J. C. F. Johnson is in charge of all engineering in the forged steel fitting and the bronze and forged steel valve divisions. Mr. Johnson will also function as representative in contacting the trade.

American Transformer Co., Newark, N. J. Walter Garlick, Jr. has been appointed vice-president in charge of sales and its related activities.

Geo. D. Roper Corp., Philadelphia office. Paul L. Goldstrohm has been named general manager of the Lewis Pump Co.,

P. L. Goldstrohm

Philadelphia, Pa., factory representative of the pump division of the company. Mr. Goldstrohm, formerly was vice-president and member of the board of directors of the Brown Instrument Co. of Philadelphia.

Blackmer Pump Co., Milwaukee office. A. C. Nydegger has resumed his duties as manager at 1127 North Van Buren Street, after serving more than two years of active duty in the United States Navy.

Allegheny Ludlum Steel Corp., Pittsburgh, Pa. Max J. Pischke, formerly Pittsburgh district sales manager, has been promoted to the position of manager of warehouse sales.

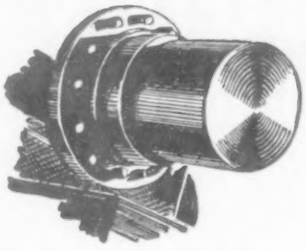
Timken Roller Bearing Co., Cincinnati office. Fred Reiser, Jr. has been promoted to division manager for all divisions of the company there, including industrial, steel, automotive and service sales. Harry McCool has been appointed sales engineer for the steel and tube division in the Cincinnati district, which includes Indiana, Kentucky and part of Ohio.

(*Continued on page* 290)

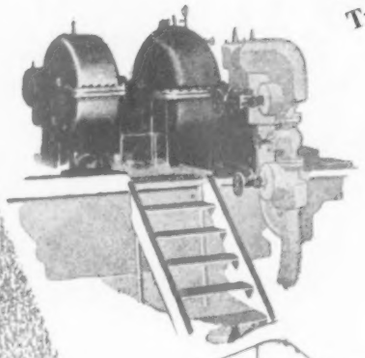
FOR EVERY SERVICE CONDITION...

You can count on

TYCOL "ENGINEERED LUBRICATION"

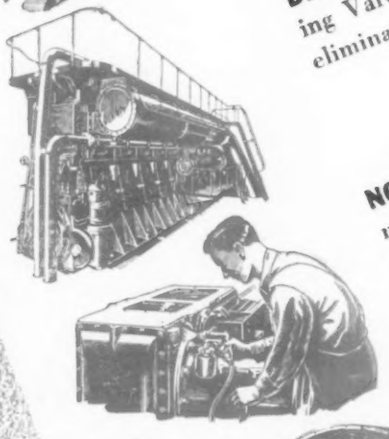


EXTREME PRESSURE GREASE—"Never a single bearing failure since we changed to Tycol E.P. Grease."



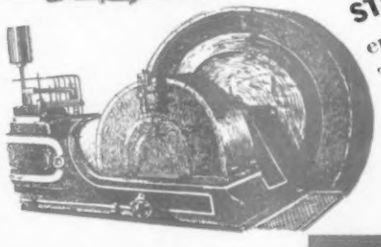
TURBINE OIL—"70,000 hours continuous operation . . . oil still in excellent condition."

DIESEL OIL—"No more trouble with Sticking Valves . . . costly delays and overhauls eliminated . . . engines giving better service . . ."



NO-RUST-OLS— Prevent rust formations on machines—small parts prior to assembly—and finished products. Usable at all temperatures by spraying, brushing, swabing or dipping.

STEAM CYLINDER OIL—"We saved 33⅓% engine lubrication costs when we changed to Tycol Cylinder Oil."



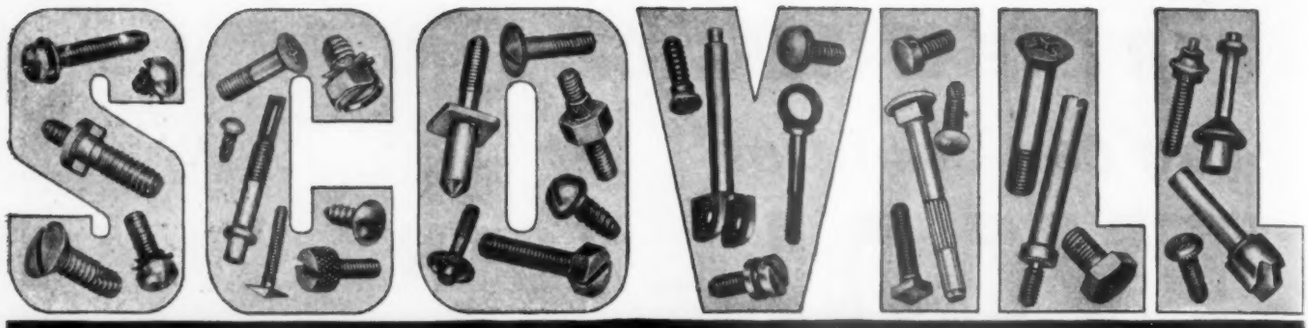
TYCOL

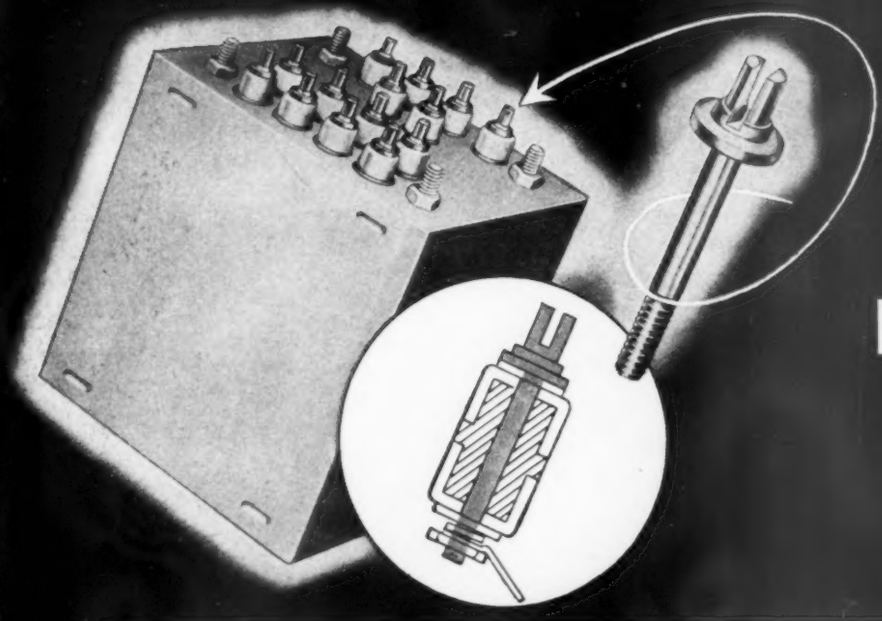
• Results such as these are typical where Tycol lubricants are specified. Call, write or wire your nearest Tide Water Associated office for full details about the lubricant best suited to your needs.

Lubrication—"engineered to fit the job"

TIDE WATER ASSOCIATED OIL COMPANY

17 BATTERY PLACE · NEW YORK 4, N. Y.





EXPERTS CAN CUT YOUR FASTENINGS COSTS

Proof #37 of Scovill cold-forging skill.

Flexibility of thinking backed by our many years of experience enabled Scovill to lick this special fastenings problem at a neat saving to the customer.

The application illustrated features a transformer part which is a combined terminal and fastening making possible the shockproof feature demanded by the severe usage to which these transformers are subjected. In this case Scovill experts found it unnecessary to consider redesigning...instead, costs were cut substantially by Scovill's ability to cold-forge the part rather than follow the former method of production.

This is but one of many examples of Scovill demonstrated ingenuity. It will pay *you* to call a Scovill fastenings expert *today* whether your fastening needs are in the Design or Production stage.

● **Call Scovill on these standard fastenings for production efficiency...Phillips Recessed Head Screws...Type F Self-Tapping Screws...Washer-Screw Assemblies.**

SCOVILL MANUFACTURING COMPANY
WATERVILLE SCREW PRODUCTS DIVISION
WATERVILLE 48, CONN. TEL. WATERBURY 3-3151

NEW YORK, Chrysler Building • DETROIT, 6460 Kercheval Avenue • CHICAGO, 135 South LaSalle Street • PHILADELPHIA, 18 W. Chelten Avenue Building
PITTSBURGH, 2882 W. Liberty Ave. • SYRACUSE, Syracuse-Kemper Insurance Bldg. • LOS ANGELES, 2627 S. Soto St. • SAN FRANCISCO, 434 Brannan St.

SYLVANIA NEWS

INDUSTRIAL EDITION

February *Published by* SYLVANIA ELECTRIC PRODUCTS INC., Ipswich, Mass. 1946

EFFICIENT, NEW, PORTABLE FLUORESCENT LAMP GETS INTO THOSE HARD-TO-LIGHT SPOTS

The Sylvania fluorescent portable lamp—P-7—is designed to be carried almost anywhere. Its streamlined shape will slide through openings as small as two inches square, and it has no sharp corners on which to catch clothing. P-7 can be relamped in a matter of seconds.

Cool, efficient, fluorescent illumination can be brought to almost any "tight spot" through the use of P-7, which was made for close work and inspection in cramped quarters.

The low brightness of the six-watt fluorescent lamp eliminates annoying glare, usually encountered with incandescent "portables"; and since fluorescent light means cool light, workers are safe from hand and forehead burns.

Because this portable is small and light weight, workers can wear it hooked to their belts, lapels or overall shoulder straps. Its rugged construction will easily withstand rough handling to be expected in the type of work for which the P-7 is designed. The twenty-gauge steel lamp guard is amply strong to protect against lamp breakage. The unit includes one six-watt white fluorescent lamp, ballast operating equipment and twelve feet of electric cord. *Write Sylvania Electric Products Inc., Ipswich, Mass.*

INFRA-RED LAMPS FOUND WIDELY USED IN INDUSTRY

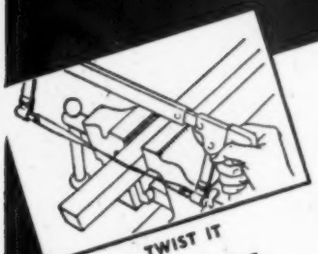
That industry has discovered the amazing utility of radiant energy is becoming more apparent day by day. Sylvania Infra-Red lamps have been saving time, reducing spoilage, saving floor space and helping industrial processes in so many other wonderful ways that hardly an industry remains that cannot benefit from installations of these lamps.

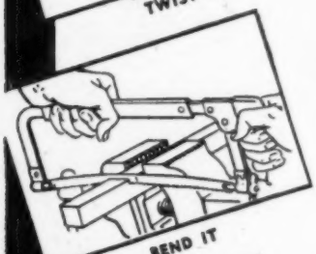
In production of your product do you—Bake? Dry? Preheat? Dehydrate?—then you must have one or more installations of Infra-Red lamps. Infra-Red lamps have been used to greatly aid the production of items ranging from flashlights to automobiles; shoes to thermos jugs; textiles to plastics—the list can be extended almost indefinitely. For details write Sylvania Electric Products Inc., Salem, Mass.

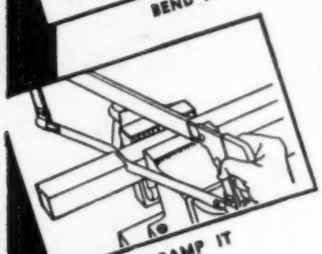
SYLVANIA ELECTRIC

MAKERS OF FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

SHATTERPROOF
HIGH-SPEED STEEL







MILFORD
FLEXIBLE REZISTOR

Made of high-speed steel, with real flexibility, it has all the advantages of the all-hard blade *plus* these . . .

- **It will not shatter or break regardless of how it is punished.**
- **It is safe . . . any mechanic can use it safely on any job.**
- **It will reduce cost and increase production.**
- **It has "Easy-Starting Teeth" in all hand sizes . . . exclusively MILFORD.**

No matter what other type of blade you have been using, the FLEXIBLE REZISTOR will do the job faster and last longer.

•

MADE IN HAND FRAME AND POWER SIZES

•

Order from your mill supply distributor. He is always ready to serve your needs for all factory and mill supplies, as well as Milford hack saw and band saw blades.

MILFORD PROFILE AND BAND SAW BLADES · REZISTOR AND DUPLEX HACK SAW BLADES

THE HENRY G. THOMPSON & SON CO.

Saw Specialists Exclusively for Over 65 Years

NEW HAVEN 5, CONNECTICUT, U. S. A.

(*Continued from page 286*)

Republic Steel Corp., Union Drawn Steel Division, Massillon, Ohio. H. E. McPherson has been appointed assistant manager of sales. His association with the company which commenced in 1928 was interrupted by 39 months of active duty with the United States Army in the Far East.

Corbin Screw Division of American Hardware Corp., New Britain, Conn. R. M. Maloney, has been named northeastern

C. M. Heller R. M. Maloney

sales representative for screw machine products primary and secondary operations and other contract jobs of a special nature. Carl M. Heller has been named sales representative in the northeast territory embracing eastern Massachusetts, Rhode Island, Maine, New Hampshire and Vermont.

Graybar Electric Co., New York office. G. M. Colwell, has been appointed supply sales manager at executive headquarters in the Graybar Building, New York. He formerly was supply manager at Detroit.

Hammel-Dahl Co., Providence, R. I. B. A. Irwin, who from 1942 through 1944 was secretary of the Petroleum Admin-

B. A. Irwin

istration for War's Materials Coordinating Committee at Washington, D. C., has been named sales manager.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis. C. N. Karr has been made sales promotion manager of the Tractor division to succeed E. L. Aikens, who was recently placed in charge of that division, Seattle, Wash. office.

Allis-Chalmers, Duluth, Minn. office. J. G. Barta of the Milwaukee district office has been appointed manager of the Duluth office to succeed W. H. Knight, resigned.

(*Continued on page 292*)

How "Mechanical" Tubing *can reduce your* production costs.

QUESTION: What is Seamless Steel "Mechanical" Tubing?

ANSWER: "Mechanical" Tubing is a term applied to tubing which is employed for structural or mechanical purposes rather than for conveying fluids or gases. It is especially designed for such purposes, and made available in the dimensions, finishes, analyses, and even formed to shape as may be required.

QUESTION: How can Seamless Steel Mechanical Tubing reduce production costs?

ANSWER: In many ways. As a time saver . . . when used instead of solid stock or forgings, extra machine operations such as boring, rough cutting, grinding, finishing, etc., can often be eliminated, thus measurably increasing production. As a material and tool saver . . . because less waste results and wear of costly tools and machines is minimized. As a power saver . . . for fewer machine operations reduce load factors.

QUESTION: How is Seamless Steel Mechanical Tubing available?

ANSWER: In carbon, alloy or stainless grades in a variety of finishes, diameters and lengths, often made to the customer's own specifications. Also formed and heat treated to specification if desired. *Pittsburgh* has facilities for cutting, upsetting, swaging, expanding, tapering, flanging, etc. Hundreds of items are stocked by distributors near you; other items are available from the mill.

If you are not now tooled up for tubing, investigate the application of Pittsburgh Seamless to your production problems, **now.** *Our engineers are at your service.*

PITTSBURGH STEEL COMPANY • 1671 Grant Building • Pittsburgh, Pa.

THE PART'S HALF DONE BEFORE YOU'VE BEGUN!
It may be better to buy and assemble product parts than to make them. Fully finished or partly finished parts similar to the ones below can be formed to specification. Send us your blueprints for recommendation and quotation.
Pittsburgh
TRADE MARK
Seamless
MECHANICAL TUBING

• Picking up a load and placing it on the exact right spot is only as efficient as the crane that lifts and carries and lowers its cargo.

Balanced drive gears with automatic oil bath lubrication—permanent alignment—anti-friction bearings—give Shepard Niles cranes precision control operation and more dependability under constant load handling. Shepard Niles cranes are designed and built for tough, long service with a thorough knowledge of the performance expected of them.

* * *

Our staff of engineers are ready today to help you to plan a better, more economical handling system. Write them.

For smooth, constant, dependable lifting and handling, select a Shepard Niles hoist. The completeness of the Shepard Niles line of electric hoists permits the selection of the most efficient lifting and load-moving equipment for any requirement.

Shepard Niles
CRANE & HOIST CORPORATION
462 SCHUYLER AVENUE • MONTOUR FALLS, N.Y.

(*Continued from page* 290)

National Radiator Company, Pittsburgh, Pa. J. C. Barnes, former manager of the Washington branch, has assumed his new duties as branch manager for Philadelphia. H. F. Seltzer, replaces Mr. Barnes as manager of the Washington, D. C. branch.

Aro Equipment Corp., Boyan, Ohio. M. J. Anderson has become affiliated with the company as sales and service engineer. D. J. Nelson has joined the I. W. Busch organization as New York state representative.

Agaloy Tubing Co., New York office. T. L. Lee has been appointed district

T. L. Lee

manager for New Jersey, New York and New England areas with offices at 75 West Street.

Ajax Flexible Coupling Co., Boston office. J. F. Collins, Statler building has been appointed field engineer and sales representative to succeed G. C. Ewing, who resigned because of ill health.

Pennsylvania Salt Manufacturing Co., Philadelphia, Pa. J. G. Brunton has been named Eastern sales manager, and J. F.

J. G. Brunton J. F. Francis

Francis has been made Western sales manager of the Agricultural Chemicals division. Both gentlemen have been serving as assistant sales managers in their respective territories.

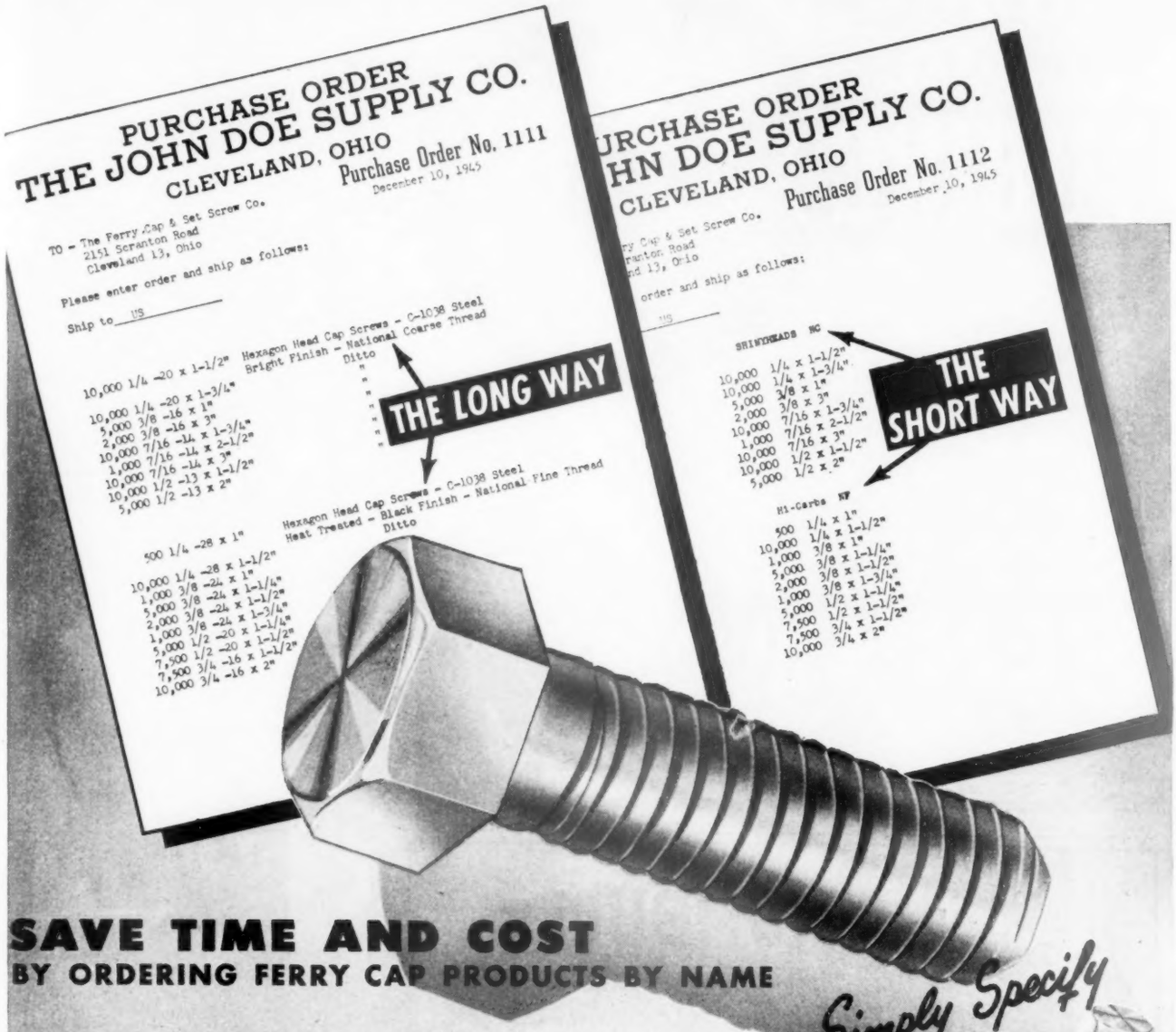
Westinghouse Electric Supply Co., Dayton office. C. B. Kennedy has been made branch manager.

Phoenix, Ariz. office. W. E. Lee, formerly of Los Angeles and a sales engineer in the mining industries, has been named manager.

Emeryville, Calif. office. J. H. Cox been promoted to engineering manager of the company's Pacific coast manufacturing and repair division.

Portland, Oregon office. H. N. Miller, a member of the industrial sales staff

(*Continued on page* 294)


PURCHASE ORDER
THE JOHN DOE SUPPLY CO.
CLEVELAND, OHIO
Purchase Order No. 1111
December 10, 1945
TO – The Ferry Cap & Set Screw Co.
2151 Scranton Road
Cleveland 13, Ohio
Please enter order and ship as follows:
Ship to US
10,000 1/4 -20 x 1-1/2" Hexagon Head Cap Screws – C-1038 Steel
Bright Finish – National Coarse Thread
10,000 1/4 -20 x 1-3/4" Ditto
5,000 3/8 -16 x 1" "
2,000 7/16 -14 x 1-3/4" "
10,000 7/16 -14 x 2-1/2" "
1,000 7/16 -14 x 3" "
10,000 1/2 -13 x 1-1/2" "
5,000 1/2 -13 x 2" "
THE LONG WAY
500 1/4 -28 x 1" Hexagon Head Cap Screws – C-1038 Steel
Heat Treated – Black Finish – National Fine Thread
10,000 1/4 -28 x 1-1/2" Ditto
1,000 3/8 -24 x 1" "
5,000 3/8 -24 x 1-1/4" "
2,000 3/8 -24 x 1-1/2" "
1,000 3/8 -24 x 1-3/4" "
5,000 1/2 -20 x 1-1/4" "
7,500 1/2 -20 x 1-1/2" "
7,500 3/4 -16 x 1-1/2" "
10,000 3/4 -16 x 2" "
URCHASE ORDER
HN DOE SUPPLY CO.
CLEVELAND, OHIO
Purchase Order No. 1112
December 10, 1945
ry Cap & Set Screw Co.
rrton Road
nd 13, Ohio
order and ship as follows:
US
SHINYHEADS NC
10,000 1/4 x 1-1/2"
10,000 1/4 x 1-3/4"
5,000 3/8 x 1"
2,000 3/8 x 3"
10,000 7/16 x 1-3/4"
1,000 7/16 x 2-1/2"
10,000 7/16 x 3"
10,000 1/2 x 1-1/2"
10,000 1/2 x 2"
5,000
THE SHORT WAY
Hi-Carbs NF
500 1/4 x 1"
10,000 1/4 x 1-1/2"
1,000 3/8 x 1"
5,000 3/8 x 1-1/4"
2,000 3/8 x 1-1/2"
1,000 3/8 x 1-3/4"
5,000 1/2 x 1-1/4"
7,500 1/2 x 1-1/2"
7,500 3/4 x 1-1/2"
10,000 3/4 x 2"

SAVE TIME AND COST
BY ORDERING FERRY CAP PRODUCTS BY NAME

You can save time, effort and cost by ordering Shinyheads and Hi-Carbs by name. No need to write up the order the long way giving unnecessary details. The Ferry Cap trade name, as indicated below, is its own specification and your guarantee.

Simply specify— **Shinyheads NC** **Shinyheads NF**

Shinyheads mean hexagon head cap screws of high carbon C-1038 steel—full finished—bright, shiny heads—NC or NF thread.

Simply specify— **Hi-Carbs NC** **Hi-Carbs NF**

Hi-Carbs mean hexagon head screws of high carbon C-1038 steel, double heat treated, black satin finish, NC or NF thread.

These Ferry Cap products are carried in stock in popular catalog sizes in bulk and in attractively labeled packages. When ordering from your distributor, simply specify Shinyheads or Hi-Carbs or both.

Simply Specify

The FERRY CAP & SET SCREW Co.

2165 SCRANTON ROAD • • • • • CLEVELAND 13, OHIO

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS • SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

BRASS and COPPER for TUBING

You can always look to PENN "SUPERIOR" SEAMLESS TUBING for these important advantages:

- Uniform wall thickness
- Bright finish inside and out
- Annealed to your specifications
- Easy bending
- Ends sealed
- Furnished in coils or straight lengths
- All sizes from 1/16" to 1" O.D. inclusive

Write, wire or phone for data

PENN BRASS & COPPER CO.
Phone 35-111 ERIE • PENNSYLVANIA
Manufacturers "SUPERIOR" BRAND BRASS AND COPPER Tubing
1920 • 1945 ★ OUR 25TH ANNIVERSARY

Look to TRUMBULL
AS YOUR DEPENDABLE SOURCE OF SUPPLY

For control . . . over-current . . . and short circuit protection, use Trumbull Combination Motor Starters . . . A better "buy" for the P.A. than the separate procurement of starters and enclosed safety switches.

Starter and disconnect in *one* enclosure, vertical double-break contacts, entire interior removable, all parts accessible from front.

STARTERS COMBINATION

CALL YOUR TRUMBULL
Electrical Wholesaler

THE TRUMBULL ELECTRIC MFG. CO • PLAINVILLE, CONN.
OTHER FACTORIES AT NORWOOD, O. — SEATTLE, SAN FRANCISCO, LOS ANGELES

(*Continued from page* 292)

for the past nineteen years, has been made manager in this area.

Jersey City office. N. C. Reed has been appointed manager of district operations of the elevator division. He will be responsible for the elevator installation and sales activities of all district offices throughout the United States.

American Machine & Gage Co., Philadelphia, Pa. district. Barwood & Co., 3137 N. 15 Street, has been named sales representative for the Size Control Co., and the Walsh Press & Die Co. Both companies are divisions of American Machine & Gage Co., Chicago.

INDUSTRIAL DEVELOPMENTS

Progressive Welder Co., Detroit, Mich., is expanding its plant floor space some fifty percent. New facilities include an adjacent factory and about 10,000 sq. ft. of new construction.

Jessop Steel Co., Washington, Pa. Fred T. H. Youngman, formerly executive vice president, has been elected president, succeeding R. Edson Emery, who was

Fred Youngman

made chairman of the board. Mr. Youngman has been associated with Jessop for the past 25 years in various capacities; namely, secretary and treasurer, first vice president, and executive vice president.

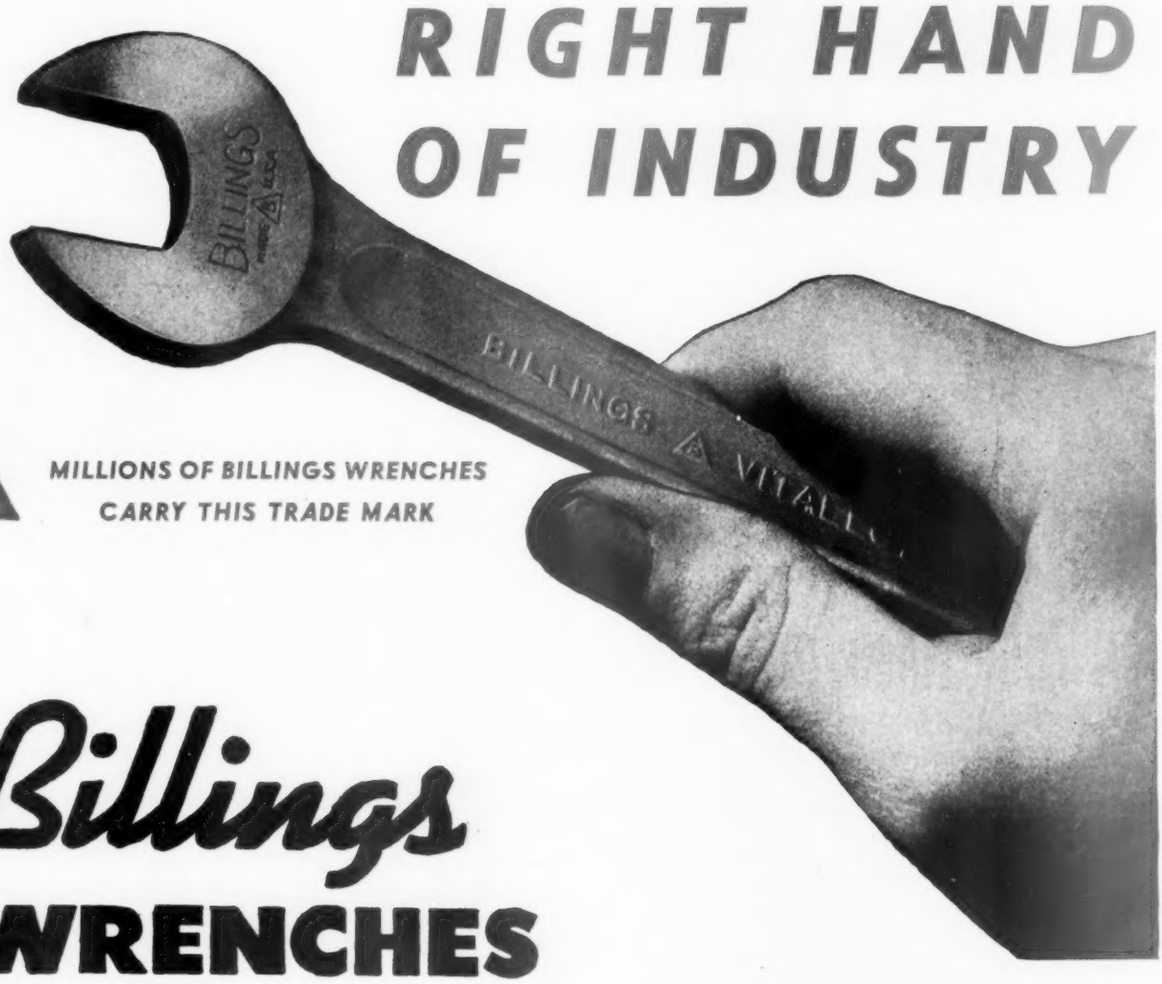
Continental Can Co., Chicago. Operations at the Chicago plastics plant have been discontinued and the equipment moved to Cambridge, Ohio. All plastics operations of the company are now located at Cambridge.

United States Steel Supply Co., Cleveland, Ohio, has acquired nine-acre industrial tract in southeast Cleveland for new steel warehouse buildings which will be more than double existing facilities. Latter will be abandoned upon completion of the new development.

Mill Products Corp., Pittsburgh, Pa., has changed its name to Fort Duquesne Steel Co. The concern is now removing its warehouse facilities and general offices to newly constructed plant at 1200 Galveston Ave., Pittsburgh.

(*Continued on page* 296)

. . . IN THE STRONG RIGHT HAND OF INDUSTRY



MILLIONS OF BILLINGS WRENCHES CARRY THIS TRADE MARK

Billings WRENCHES

Workmen like them. In war and peace, production line records prove their sound judgement. . . Billings wrenches always have been and will continue to be the strong right hand of industry. . . Be sure to say "Billings" — you, too, will like them.

BUY BILLINGS TOOLS THRU YOUR INDUSTRIAL DISTRIBUTOR

IF YOU USE SPECIAL FORGINGS BILLINGS MAKES THEM, TOO — TO YOUR SPECIFICATIONS

Billings FORGED TOOLS

THE BILLINGS & SPENCER CO.

HARTFORD 6, CONN., U.S.A.

Ask Us TO QUOTE ON YOUR NAME PLATE NEEDS

Whenever the subject of Name Plates is up be sure to get our prices. We assure you a prompt, courteous response to your request.

Perhaps you or your Engineering Department should have one of our "Design for Name Plates" books, showing over 4500 sizes and shapes of name plates for which we have dies in stock. This book will give you valuable help, and save you money on your name plate requirements. Write us—now.

ECOA
Name Plates

ETCHING COMPANY OF AMERICA

1520 Montana Street, Chicago 14, Illinois, Dept. C-2

Metal Name Plates, etched or lithographed • Plastic Name Plates, Dials and Panels, lithographed or screened • Etched Metal Scales, Clock Dials, Instrument Panels, Art Novelties, Advertising Specialties • Etched Metal Panels for elevators and architectural uses.

SUBSIDIARY OF DODGE MFG. CORPORATION, MISHAWAKA, INDIANA

(*Continued from page* 294)

Container Corporation of America, Chicago, Ill., will add a paperboard machine, power plant and necessary buildings to its Fernandina, Fla. pulp mill. The new unit is a Fourdrinier paperboard machine trimming 160" featuring latest improvements and design.

Ohio Rubber Co., Willoughby, Ohio, and Long Beach, Calif. Brigadier General Hermon F. Safford, wartime Rubber Director of the United States Ordnance Department and recipient of the Dis-

H. F. Safford

tinguished Service Medal and the Legion of Merit, has been elected executive vice president. The company is now expanding its Willoughby and Conneautville plants, and is about to erect an entirely new plant in Long Beach, Calif.

Westinghouse Electric Corp., Pittsburgh. At the end of 1945 company had the greatest production capacity in its 60-year history. During the last year the company has provided $61,000,000 for the reconversion of its plants and the expansion of its manufacturing facilities. More than $8,000,000 has already been spent, and most of the remainder of this amount will be spent during the next 12 months.

B. F. Goodrich Co., Akron, Ohio. Celebrating its 75th anniversary on January 3rd, ground was broken for new research

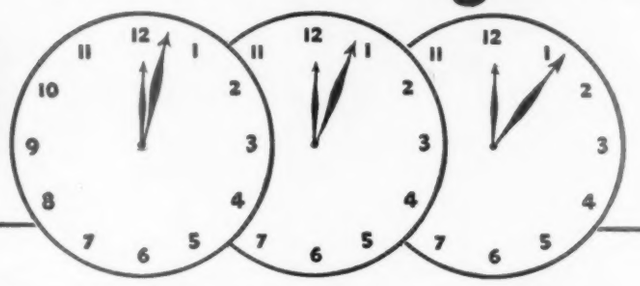
New research center

center on 260 acre tract between Akron and Cleveland. Plans call for five separate air conditioned buildings. At outset of operations the staff will consist of between 220 to 250 persons. Dr. Howard E. Fritz is director of research.

Federal Machine & Welder Co., Warren, Ohio, has acquired the Sommer & Adams Co., Cleveland, designers and builders of a variety of special machine tools, and has also entered the metal furniture field with establishment of new division under the name of "Modera." Sommer & Adams will be operated as subsidiary. Federal has also acquired beauty parlor

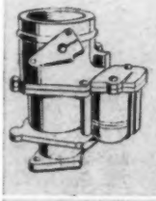
(*Continued on page* 300)

How to Cut Metal Cleaning Time to MINUTES



NEW, FAST-ACTION DETERGENT CLEANS FERROUS AND NON-FERROUS METALS...Easy to Handle

TYPICAL USES FOR Solvent "26"



CARBURETORS—Solvent "26" removes gum, gasolene sediment and other accumulations of dirt.

SPARK PLUGS—Solvent "26" safely cleans porcelain; helps loosen carbon deposits.

METAL PLATES AND SCREENS—Solvent "26" restores clear, clean finish to any metal surface.

DIES AND STAMPING—Solvent "26" removes drawing compounds from die-formed or stamped metal.

LABORATORY EQUIPMENT—Solvent "26" frees glass and metal tubing and their supports of gums, varnishes and other incrustations or deposits.

PISTONS—Removes lacquers, gums, resins, etc. from gas, gasolene and diesel engine pistons and rings. Also effective for cleaning all parts of dismantled motors, engines and machinery.

REMOVES:

Oil • Grease • Gums • Varnishes • Lacquers • Paints
Carbonaceous Deposits • Asphaltic Products

FROM:

Steel • Cast Iron • Aluminum • Porcelain • China
Chrome and Nickel Plate • Stone • Precious Metals
Brass • Washable Fabrics

Used throughout the war in critical industry as a superior cleaning agent, newly-developed SOLVENT "26" is now available for all industrial needs.

Offering many advantages in time, labor and cost over other present cleaning methods . . . Solvent "26" is so effective a detergent it can be used at *ordinary* room temperatures.

The fast action of Solvent "26" reduces cleaning time from hours to minutes on dismantled engine parts and all kinds of machinery. Simply dip, rub, brush or spray it on. Then flush clean with hot water.

Mail the coupon today for literature and information leading to a demonstration of this unique product in your own plant.

CITIES SERVICE OIL COMPANY
ARKANSAS FUEL OIL COMPANY

CITIES SERVICE OILS
ONCE-ALWAYS

Cities Service Oil Company
Room 644
70 Pine Street
New York 5, N. Y.

Gentlemen: I am interested in a demonstration of Solvent "26"—at no cost or obligation.

Name.....

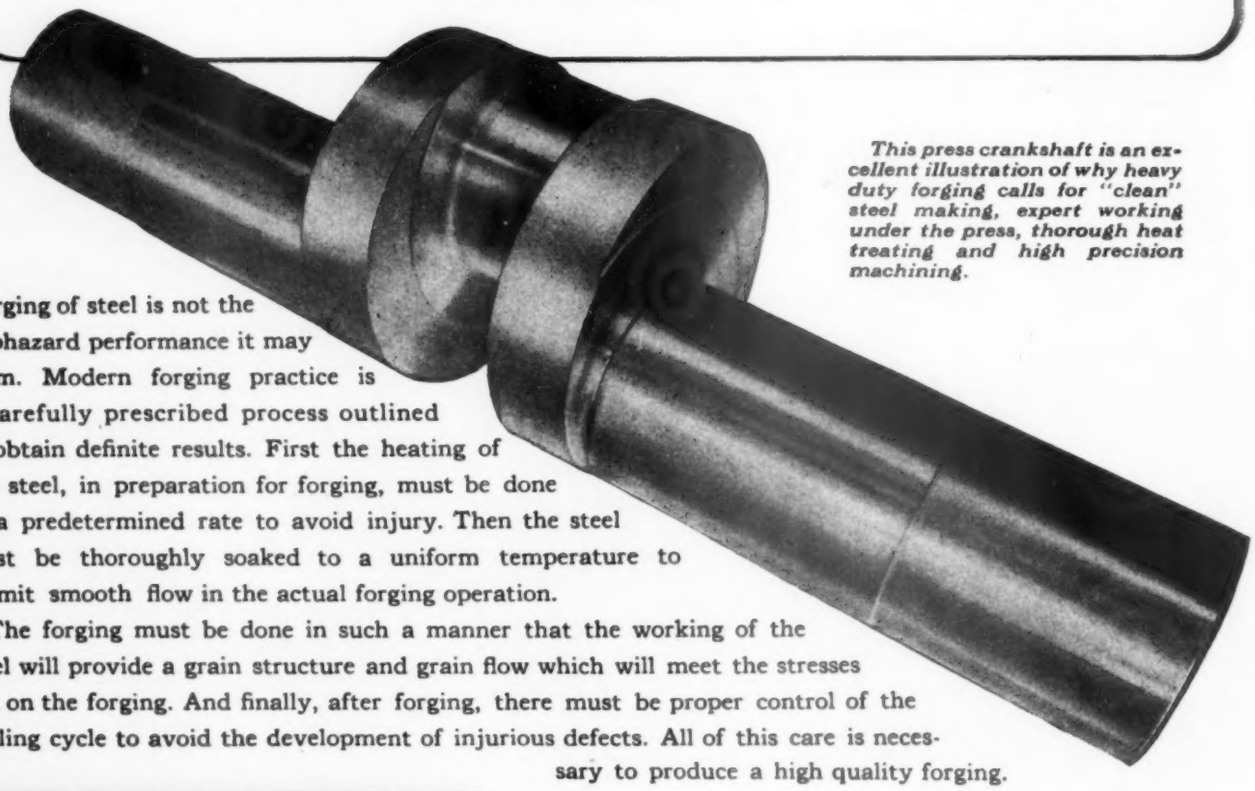
Title.....

Company.....

Address.....

City.....State.....

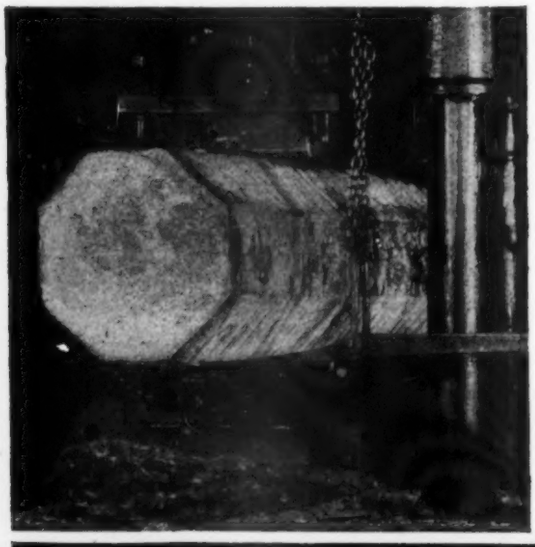
WHAT ABOUT THE *FORGESMITHING* IN THE STEEL *FORGINGS* YOU BUY?



This press crankshaft is an excellent illustration of why heavy duty forging calls for "clean" steel making, expert working under the press, thorough heat treating and high precision machining.

Forging of steel is not the haphazard performance it may seem. Modern forging practice is a carefully prescribed process outlined to obtain definite results. First the heating of the steel, in preparation for forging, must be done at a predetermined rate to avoid injury. Then the steel must be thoroughly soaked to a uniform temperature to permit smooth flow in the actual forging operation.

The forging must be done in such a manner that the working of the steel will provide a grain structure and grain flow which will meet the stresses put on the forging. And finally, after forging, there must be proper control of the cooling cycle to avoid the development of injurious defects. All of this care is necessary to produce a high quality forging.



NATIONAL FORGING IS A SKILL OF THIRTY YEARS STANDING

At National every forging presents its own challenge to correct forgesmithing. That is why National Forge is so meticulous in setting up the prescribed procedure which it uses in heating the steel, forging and cooling. It's the long acquired forging "know how" that makes the difference in National Forgings—a difference you should know about now if you have steel forgings to buy.

NATIONAL FORGE & ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNSYLVANIA

New ways to save with PHILCO BATTERIES

Now you have palletized unit loads, and the new long-life Philco "Thirty" motive power batteries to make modern electric trucks even more useful and economical. The 30% longer life of Philco "Thirty" means substantial savings in battery replacements. Ask for Philco "Thirty" as initial equipment in your new trucks. Specify Philco "Thirty" on battery replacement orders. Write for specification data today. PHILCO CORPORATION, Storage Battery Division, Trenton 7, New Jersey.

PHILCO

FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT

CM

68 Years of experience really means something

HOISTS

COMET light weight electric hoist. Capacities from ⅛th to 1 ton.

METEOR heavy-duty electric hoist. Capacities from ½ ton and up.

CYCLONE 12 bearing high speed hand hoist. Capacities from ¼th ton and up.

Since 1876 Chisholm-Moore has been providing industry with many types of overhead materials handling equipment. These years of experience combined with "service-thinking" engineering skill are reflected in the operating efficiency, durability, economy and safety features of all CM materials handling equipment... Hand Chain Hoists, Electric Hoists, Monorail Trolleys, Traveling Cranes, CM Puller (for horizontal pulling) and other CM equipment are fully illustrated and described in Catalog 1944. You'll find the information most helpful. Write us today for a copy.

CHISHOLM-MOORE
HOIST CORPORATION
(Affiliated with Columbus-McKinnon Chain Corporation)
GENERAL OFFICES AND FACTORIES: 136 Fremont Ave., TONAWANDA, N. Y.
SALES OFFICES: New York, Chicago and Cleveland

(*Continued from page* 296)

furniture manufacturing facilities and equipment of the Helene Curtiss Chrome Co., Chicago.

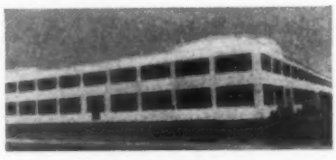
Perfect-Line Mfg. Corp. has been formed at Hicksville, N. Y. for manufacture of wide range of electrical equipment and specialties — ventilating equipment, receptacles, switch plates for oil burners, etc. Alfred Robbins is president and chief engineer. He formerly was member of engineering staff of Burndy Engineering Co.

John Harsch Bronze & Foundry Co., Cleveland, Ohio has entered the permanent mold casting field. L. A. Kristoff is head of permanent mold technique and production.

Bemis Bros. Bag Co. is opening a new textile bag manufacturing plant in Los Angeles, Calif. Building vacated by Consolidated Vultee Aircraft Corp., has been leased at 5401 East Slauson Ave. It is 415 feet long and 145 feet wide. C. H. Dekker is manager of the new factory.

H. O. Canfield Co., 129 Housatonic Ave., Bridgeport, Conn., manufacturers of rubber and synthetic rubber products, has established a design engineering service, which is available to all branches of industry.

Continental Can Company's Paper Division has acquired factory building at 4950 Long Beach Ave., Los Angeles, Calif., for



New factory building

the manufacture of a full line of paper products except paper drums. Building has floor space of 114,000 sq. ft.

E. I. du Pont de Nemours & Co., Wilmington, Del. announces consolidation of two divisions of the Organic Chemicals Department into a single unit under the name of the Petroleum Chemicals Division. The merger combined the former Alcohol and Tetraethyl Lead Divisions operating plants at Deepwater, N. J. and Baton Rouge, La.

Rustless Iron & Steel Corp., Baltimore, Md. President Calvin Verity announces merger of Rustless into the American Rolling Mill Co.

Gisholt Machine Co., Madison, Wis. Announcement is made of the purchase of the machine tool business of International Detrola Corp. of Elkhart, Ind. Foster inventory, designs, patents, backlog of orders and goodwill pertaining to Foster, Midland and Libby Turret lathes, Fastermatic Platen and Turret Type automatic lathes, and entire line of super finishing machines will be moved to Madison.

(*Continued on page* 304)

NEW PROBLEMS?

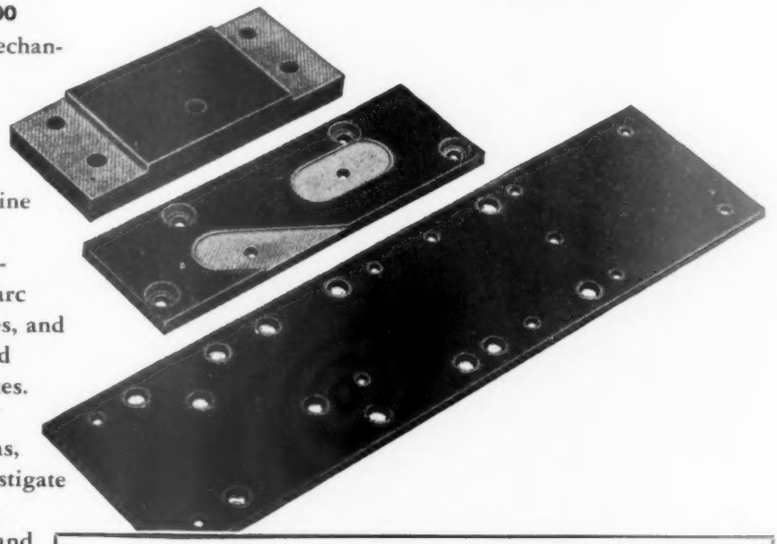
C-D has new electrical insulating materials to help you solve them

Here are some representative improved properties of various new C-D Electrical Insulating Materials.

Power Factor (at 10^6 cycles per second)	**0.011**
Dielectric Strength, volts per mil.	**750**
Arc Resistance, seconds	**185**
***Insulation Resistance, megohms**	**30,000**

New higher standards are also obtainable on mechanical properties, heat and moisture resistance, dimensional stability and fabricating.

The parts illustrated were fabricated from new grade GB 128 M DILECTO which is a glass fabric base laminate employing a melamine the equivalent of Navy Type GHG. This new grade of DILECTO provides higher heat resistance, greater dimensional stability, superior arc resistance and improved mechanical properties, and is noncombustible when compared to standard paper and cotton fabric base phenolic laminates.



These new C-D insulating materials may be the answer to your "What Material?" problems, and will save you much time and worry. Investigate them while your products are in the planning stage. Wire, phone or write our nearest office and a C-D technician will be made available to you.

*Insulation Resistance values based on samples conditioned or 96 hours at 90% ± 2% relative humidity at 35° ± 1°C.

C-D PRODUCTS

The Plastics

DILECTO—Thermosetting Laminates.
CELORON—A Molded Phenolic.
DILECTENE—A Pure Resin Plastic Especially Suited to U-H-F Insulation.
HAVEG—Plastic Chemical Equipment, Pipe, Valves and Fittings.

The NON-Metallics

DIAMOND Vulcanized FIBRE
VULCOID—Resin Impregnated Vulcanized Fibre.
MICABOND—Built-Up Mica Electrical Insulation.

Standard and Special Forms

Available in Standard Sheets, Rods and Tubes; and Parts Fabricated, Formed or Molded to Specifications.

Descriptive Literature

Bulletin GF gives Comprehensive Data on all C-D Products. Individual Catalogs are also Available.

Continental-Diamond C-D Engineered Dielectrics

RHC—46

BRANCH OFFICES

NEW YORK 17 • CLEVELAND 14 • CHICAGO 11 • SPARTANBURG, S. C. • SALES OFFICES IN PRINCIPAL CITIES
WEST COAST REPRESENTATIVES: MARWOOD LTD., SAN FRANCISCO 3
IN CANADA: DIAMOND STATE FIBRE CO. OF CANADA, LTD., TORONTO 8

SEE OUR CATALOG IN SWEET'S

Continental-Diamond FIBRE COMPANY

Established 1895..Manufacturers of Laminated Plastics since 1911—NEWARK 41 • DELAWARE

Once Again Available...
OKONITE INSULATION
made with wild Up-River Fine Para Rubber

Here is important news — the return of Okonite insulation — made possible because the use of natural rubber has been authorized for those severe service conditions where wires and cables are to be installed in wet locations.

Back in November, 1943, when the supply of natural rubber was withdrawn, The Okonite Company announced that it would no longer be able to provide Okonite insulation because this high-grade compound could not be made without a particular kind of natural rubber — wild Up-River Fine Para Rubber.

Now, with the gradual return of natural rubber, the latest W.P.B. rubber order recognizes that certain vitally important needs for rubber must be served first. One of these is for wires and cables operating in wet locations, an installation condition where many years of service experience have shown Okonite rubber insulation to be outstanding.

Therefore, Okonite insulation made with wild Up-River Fine Para Rubber, applied to the conductor by the Okonite strip insulating method and vulcanized in a continuous metal mold, is once again available to the electrical industry for these restricted — but most important — applications. *Okonite insulation is exactly the same compound it always was, possessing the same characteristics which years of experience have confirmed . . .* its exceptionally long life, its ability to retain tensile strength and elasticity, its high electrical values. The Okonite Company, Passaic, New Jersey.

A complete story on Okonite insulation is available in Research Bulletin 101 which includes engineering details, illustrations of methods used to safeguard performance, and records of electrical tests.

OKONITE SINCE 1878
insulated wires and cables 4401

the
RED
ELASTIC
COLLAR
protects
permanently
the RED ELASTIC COLLAR — denoting an ESNA product — is . . .
. . . permanently clinched to prevent turning under application and subsequent operational stresses.
. . . permanently secure against vibration effects. The bolt impresses (does not cut) full contact threads.
. . . permanently tight against moisture. Bolt threads have 100% contact in collar; and are fully seated in metal.
. . . permanently elastic. The Red Collar retains its grip after repeated usage.

What happens when this Red Elastic Collar becomes part of a nut? The nut becomes an ESNA Elastic Stop Nut! And it provides permanent protection for any detachable or adjustable assembly.

How?

First, **an Elastic Stop Nut *locks in position anywhere on a bolt or stud.* Every bolt can be precisely prestressed to carry its full load. Positioning devices can be adjusted with precision. Vibration cannot disturb these settings — because the Red Elastic Collar eliminates all play between bolt and nut threads with its full contact, permanent grip.**

Second, **it *prevents thread corrosion.* Moisture is sealed out. Adjustment or removal is easy — any time.**

Third, **it *prevents thread damage.* Full thread contact in the Red Elastic Collar keeps the metal threads firmly seated. Axial play caused by vibration or stress reversal is dampened.**

Fourth, **it *prevents seepage of liquids past bolt threads.* Permits nut to be used as a sealing device.**

Fifth, **it *prevents maintenance waste.* The Red Elastic Collar, which does not injure the bolt or its plating, permits repeated usage.**

Here's a challenge: **Send us complete details of your toughest bolted trouble spot. We'll supply test nuts — FREE, in experimental quantities. Or, if you want further information write for literature. Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents in principal cities.**

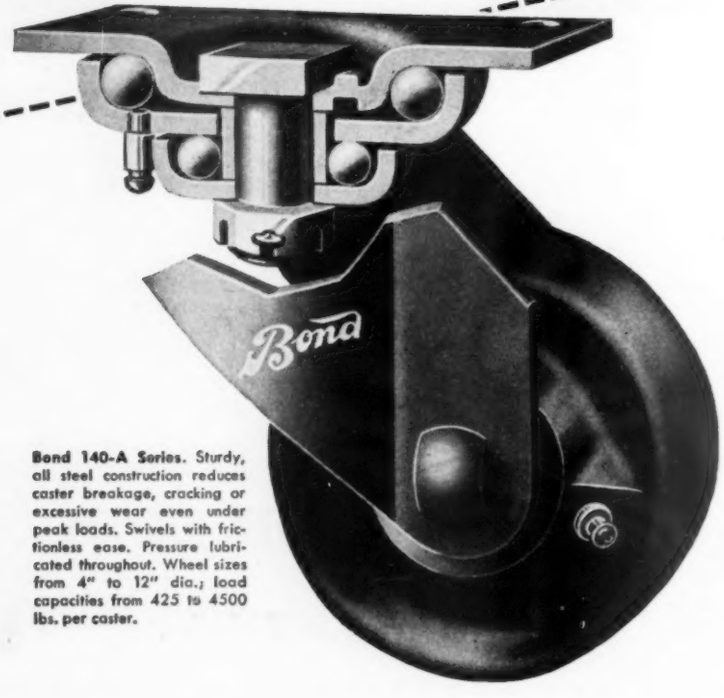
ESNA

ELASTIC STOP NUTS

PRODUCTS OF: **ELASTIC STOP NUT CORPORATION OF AMERICA**

Bond 136-A Caster. Combines easy swiveling with long service. Special double ball race design ... built of durable Bond Caster metal. Pressure lubricated throughout. Wheel sizes from 4" to 12" dia.; load capacities from 600 to 1700 lbs. per caster.

You need the right casters to do your job right!
Every Bond REG U.S. PAT OFF built-for-the-job caster is engineered for efficient, economical, long-life service. Select the right casters for your jobs from the Bond REG U.S. PAT OFF catalog K-36—sent free.
BOND FOUNDRY & MACHINE CO., MANHEIM, PA.



Bond 140-A Series. Sturdy, all steel construction reduces caster breakage, cracking or excessive wear even under peak loads. Swivels with frictionless ease. Pressure lubricated throughout. Wheel sizes from 4" to 12" dia.; load capacities from 425 to 4500 lbs. per caster.

(*Continued from page 300*)

B. F. Goodrich Company will construct plant for the processing of plastics near Marietta, Ohio. Cost of project will be approximately $4,000,000.

Caswell-Runyan Co., Huntington, Ind., has become an operating division of the International Detrola Corp., which also includes Utah Radio Products Co., and the Universal Cooler Corporation.

Philco Radio & Television Corp., wholly-owned subsidiary which handles distribution of Philco products in the United States, is replaced by Philco Products Incorporated.

Chester Electric Steel Co., is name of new company which has acquired the Crun Lynn Foundry at Chester, Pa. New company will specialize in carbon alloy and stainless steel castings, and will be headed by Fred Grotts, president of Fort Pitt Steel Castings Co.

Ajax Flexible Coupling Co., Chicago office. R. R. Bauman has been named sales representative with headquarters at 407 South Dearborn Street.

Bassick Co., Bridgeport, Conn. George L. Meyers, Jr., chairman of the board of directors has been elected president, succeeding W. A. Rose, resigned. Mr. Rose will continue as director, and Mr. Meyer will retain the chairmanship. Walter F. Herold, vice president and chief engineer, was made executive vice president and will continue in direct charge of engineering.

Edward Valve & Mfg. Co., Inc., East Chicago, Ind., has been named Edward Valves, Inc. The company, which manufacturers cast and forged steel valves is a subsidiary of the Rockwell Manufacturing Co. There will be no change in personnel or sales policies.

Precision Welder & Machine Co., Cincinnati, Ohio, has acquired building at 138 East McMicken Ave., Cincinnati, with 25,000 sq. ft. of manufacturing space, more than trebling old quarters.

United Aircraft Products, Inc., Dayton, Ohio, aeronautical manufacturers and engineers, announces entry into the hydraulic jack field covering every phase from automotive and utility jacks to aviation railroad and industrial jacks.

Bendix Aviation Corp., Detroit, Mich., announces that approximately $25,000,000 will be expended for the purchase and modernization of plants and facilities to carry out peace-time operations.

Aeronautical Products, Inc., announces that the company's manufacturing program and executies offices will be consolidated in Washington Court House, Ohio. Office will be maintained in Detroit to serve the area. Plant has 90,000 square feet of floor space equipped with modern production machine tool, steel processing, heat treat, plating and inspection equipment.

LIQUIDATING SURPLUS EQUIPMENT AT REDUCED PRICES

GRINDERS

One — 12 x 48 Mattison Surface Grinder, serial No. 11938, with built-in 15 H. P. motor, 220/440, 3-60. Machine in good condition, taken from service, and has the following list of equipment:

1 12 x 48" Magnetic Chuck
1 Diamond Foot Bracket
2 16" Wheel Adapters
16 New Norton Wheels 3836-J8BE

One — Pratt & Whitney 14" Surface Grinder, motor drive, 25 H. P. motor, 3-60-220. Condition good, taken from service. Serial No. 1081, and has the following equipment:

3 Handwheel Dressers
4 14" Segment Wheel Adapters
23 Sets Sterling Grooved Type Segments

One — Bryant 12" Grinder, serial No. G-2634, direct motor drive, 3-60-220, wheel motor, 2 H. P., 3-60-220. Condition is excellent and has the following list of equipment:

1 Wheel Dressing Attachment
1 Belt guard
1 10" Collet Chuck
1 10" Collet
3 Bryant Wheel Heads

One — Bryant No. 10A Automatic
Chuck range — 12"
Total chuck swing — 12⅝"
Max. wheel slide traverse — 14½"
Max. grinding length,
Standard wheel heads — 11"

1 10" Dia. 4-jaw independent chuck
1 10" Dia. face plate
4 Projectors
1 Standard Wheel Dresser
1 Grinding Wheel Head

One — 8" Heald Ring Grinder, No. 20, motor drive, 3 H. P., 3-60-220, with 8" magnetic chuck.

One — No. 12 Greenfield Hydromatic, motor drive:
Swing — 15"
Grinds hole up to — 5"
Depth — 4"
Ball bearing — work head. Spindle Speed three — 214,383,572 R. P. M. Condition — Excellent.

MILLERS

One — 2-24 Cincinnati Automatic Plain Miller, motor drive, 3 H. P., 3-20-60. Has the following equipment:

1 Arbor support
1 Long arbor 1¼" Dia.
1 Long arbor bushing for arbor support
1 Long bushing 1¼" I. D. x 1¾" O. D.
2 Short bushings 1¼" I. D. x 1¾" O. D.
1 Stub arbor, 1" hole
1 Draw rod

One — No. 2 Brown & Sharpe plain miller, geared feed, belt drive, no counter-shaft, in good condition.

DEEP HOLE DRILL PRESS

One — 2" Minster, heavy duty, single pulley drive. Very good condition.

SCREW CUTTING LATHES

One — 20 x 10 handy geared head, quick-change gear, motor drive, with motor, 3-60-220, and has the following equipment:

1 4-jaw heavy duty chuck
1 3-jaw heavy duty chuck
1 Scroll chuck
1 Face plate
1 Tool post
Centers
Dog holders and many other tools

One — 12 x 5 handy heavy duty yoke head, quick-change gear, taper attachment, with the following equipment:

1 Collet Draw Rod
2 Head Stop Centers
1 Tail Stop Drill Chuck
1 Tool Post
1 4-jaw Independent Chuck

One — 14 x 6 Pratt & Whitney Tool Room Lathe, taper attachment, standard change gear, with full set of gears, arranged for motor drive, with Drive-All, and has the following equipment:

1 Draw Rod
9 Collets (Sizes ranging from ¼" to ¾")

TURRET LATHES

One — J. & L. 3 x 36 geared head, single pulley drive, chuck machine, equipped with the following:

1 3-jaw Universal Chuck
1 Complete set of turret tool holders
1 Drill Chuck
1 Roller Box
1 Cut-off slide
Many more extra equipment
Reasonably Priced.

CUT-OFF MACHINE

One — Cincinnati Abrasive, direct motor drive, 2" capacity, cast iron — bronze — aluminum.

Pratt & Whitney Tread Millers, 6 x 14, belt drive, with full sets of change gears and chuck.

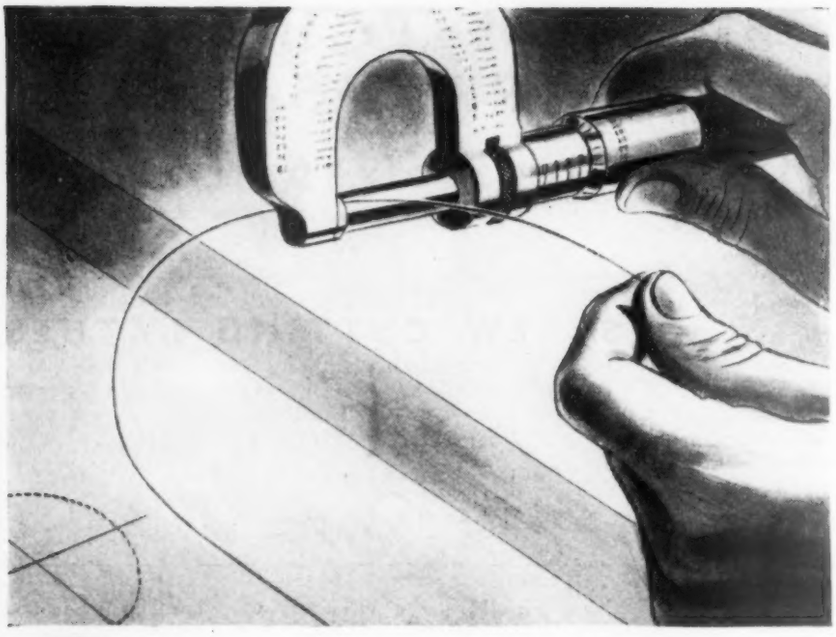
Send for Booklet No. 22

MARKS MACHINE TOOL CORP.

60 FRANKLIN STREET Telephone 6-5736 WORCESTER, MASS.

When you think of a used machine, to buy or sell, think of MARKS MACHINE

$ $ $ SAVED — ARE $ $ $ EARNED



Put a "Mike" on Your Tracing Cloth Preference

A line that you make on Arkwright Tracing Cloth is measurably different, so clean and sharp that it almost seems as though you could pick it up. This exceptional quality comes partly from the unusual transparency of the material, and partly from the fact that the line doesn't spread. Then, too, the absence of pinholes, specks, dirt, or stains helps to give the illusion that the lines are floating on air.

The exclusive features of Arkwright Tracing Cloths are measurable, and tangible enough to support a preference. The transparency, for instance, is obtained by special mechanical processing, not by surface oils. The cloth does not become brittle with age. It can take erasure upon erasure without wearing through. Re-inking over an erasure can be done without feathering.

All of these features together make for better prints. You can see this for yourself at our expense. Free samples gladly furnished. Arkwright Finishing Co., Providence, R. I.

★

Sold by leading drawing material dealers everywhere

★

Arkwright
TRACING CLOTHS
AMERICA'S STANDARD FOR OVER 20 YEARS

CIVILIAN PRODUCTION ADMINISTRATION CLOSES FIELD OFFICES

The Civilian Production Administration announces that all its field offices have been closed. All applications for priorities assistance under Priorities Regulation 28, heretofore handled in the field offices, must be forwarded to its headquarters in Washington for handling, CPA said.

Replacing the field offices as sources of supply for priority application forms, will be 115 First Class Postoffices in cities where CPA field offices have been located. The forms will also be available in the Smaller War Plants Corporations field offices. CPA officials explained that there would be no one available in the postoffices to assist applicants in filling out the forms. The revised CPA 541-A forms, on which application is made for assistance in breaking industrial reconversion bottlenecks under PR-28, will also be available in Room 1501 Social Security Building, Washington, D. C., as will other forms which business may need.

Criteria for qualifying for priorities assistance from the Civilian Production Administration has not been changed in any way by the new distribution system for the 541-A forms.

The conditions which applicants for "CC" or bottleneck breaking priorities assistance must meet are stated in the PR 28 Regulation. In the case of those applying for priorities aid to get steel, additional information must be furnished, CPA officials reiterated. These are:

1. Sources of supply and yearly tonnage received from each source in 1939, 1940 and 1941.
2. Copies of all orders already accepted, giving date, order number, tonnage and delivery promise.
3. Shipments received in each of two months previous to the filing of the application.
4. Absolute minimum amount of material required to operate plant until established sources of supply can reach the desired tonnage.
5. Can a substitute material be used temporarily?
6. Can the plant use its labor to produce from less critical types of steel until the type suggested can be furnished under normal conditions?
7. State specific type and grade of material required and why such type and grade are necessary.

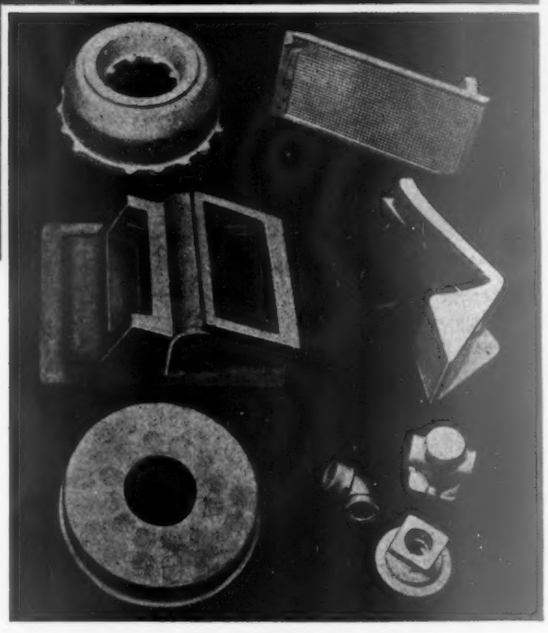
Form 541-A at Post Offices

First Class postoffices in the following 115 cities which will have a supply of the revised CPA 541-A form for those desiring to apply for assistance under Priorities Regulation 28:

Akron, Ohio.	Little Rock, Ark.
Albany, N. Y.	Los Angeles, Calif.
Albuquerque, N. M.	Louisville, Ky.
Allentown, Penn.	Madison, Wis.
Atlanta, Ga.	Manchester, N. H.
Bangor, Maine.	Memphis, Tenn.
Baltimore, Md.	Miami, Fla.
Birmingham, Ala.	Milwaukee, Wis.

(Continued on page 308)

Above: 2200 pound valve bronze casting.



CASTINGS UP TO 10,000 POUNDS EACH

Many years of experience covering the widest range of work—a modern up-to-date foundry with the finest equipment—are important reasons why Harsch Non-Ferrous Castings are unexcelled and enjoy the confidence of *hundreds* of exacting manufacturers.

Why not make Harsch your chief source of non-ferrous castings?

BRONZE—COPPER HARSCH ALUMINUM CASTINGS

Harsch offers complete casting service — pattern design and construction — engineering — Navy approved laboratory—certified heat treating—all alloys.

The JOHN HARSCH BRONZE and FOUNDRY Co.

Sales Offices: New York, Chicago, Detroit, St. Louis, Pittsburgh, Akron

12502 BEREA ROAD CLEVELAND 2, OHIO

ALUMINUM PERMANENT MOLD CASTINGS

DOLGE *Tested* PRODUCTS

for maintenance requirements

More than fifty years' experience, latest laboratory equipment and continual research is behind Dolge Tested Products. Whatever your maintenance problem, (insecticides, disinfectants, deodorants, cleaners, floor finishes and ground materials) Dolge dependable products will serve you efficiently and economically.

● ALTA-CO POWDER
For Athlete's Foot control.

● BAN
A cleaning powder. Works in hard water.

● BRITEWAY
A liquid cleaner that leaves a pleasant cedar aroma.

● BALMA
A mild, smooth soap for the skin

● DEODOROMA
Deodorizing blocks. Five bracing scents: rose, carnation, new mown hay, sandalwood, cedar.

● TILEBRITE
Removes rust stains easily and quickly.

● DOLCOROCK
A high gloss floor finish. Resistant to water.

● DOLCOWAX
A long lasting floor finish that needs no polishing.

● BETAFORM
For hard-shelled insects. Kills on contact.

● TINK
Clears clogged or sluggish drains.

● FLUSHOUT
A cleanser for bowls.

● WIND-O-SHINE
Makes it easy to clean windows.

And many others . . .

This is only a partial list of dozens of Dolge products.

Write today for the Dolge catalogue. It contains the solution to dozens of health and maintenance problems.

The C. B. DOLGE CO. WESTPORT, CONNECTICUT

DEATH TO DISEASE — DOLGE

PLYWOOD

Pacific Mutual Door Co.

QUALITY PAMUDO SERVICE

National Distributors

DOUGLAS FIR PLYWOOD

Since 1921

Mills: OREGON, WASHINGTON
Home Office: TACOMA 1, WASH.

Six Branch Offices and Warehouses

CHICAGO 8, ILL. — ST. PAUL 4, MINN. — KANSAS CITY 3, KAN.
GARWOOD, N. J. — BALTIMORE 31, MD. — LOS ANGELES 21, CAL.

WRITE US FOR PRICE LIST AND GRADE USE GUIDE

(*Continued from page* 306)

Bismarck, N. D.
Boston, Mass.
Boise, Idaho.
Bridgeport, Conn.
Brooklyn, N. Y.
Buffalo, N. Y.
Canton, Ohio.
Casper, Wyo.
Charlestown, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Clarkesburg, W. Va.
Columbia, S. C.
Columbus, O.
Dallas, Texas.
Davenport, Ia.
Dayton, O.
Decatur, Ill.
Denver, Col.
Des Moines, Ia.
Detroit, Mich.
Duluth, Minn.
Eau Claire, Wis.
Elmira, N. Y.
El Paso, Tex.
Erie, Penn.
Evansville, Ind.
Fargo, N. D.
Fort Wayne, Ind.
Grand Rapids, Mich.
Green Bay, Wis.
Greenville, S. C.
Harrisburg, Penn.
Hartford, Conn.
Helena, Mont.
Honolulu, Hawaii
Houston, Tex.
Huntington, W. Va.
Indianapolis, Ind.
Jackson, Miss.
Jacksonville Fla.
Johnstown, Penn.
Juneau, Alaska.
Kansas City, Mo.
Knoxville, Tenn.
Lima, Ohio.
Minneapolis, Minn.
Montpelier, Vt.
Nashville, Tenn.
Newark, N. J.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Norfolk, Va.
Oklahoma City, Okla.
Omaha, Neb.
Peoria, Ill.
Philadelphia, Penn.
Phoenix, Ariz.
Pittsburgh, Penn.
Portland, Me.
Portland, Ore.
Providence, R. I.
Raleigh, N. C.
Reno, Nev.
Richmond, Va.
Rochester, N. Y.
Rockford, Ill.
Sacramento, Calif.
Saginaw, Mich.
St. Louis, Mo.
Salt Lake City, Utah.
San Antonio, Tex.
San Diego, Calif.
San Francisco, Cal.
San Juan, Puerto Rico.
Scranton, Penn.
Seattle, Wash.
Sioux Falls, S. D.
South Bend, Ind.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Tampa, Fla.
Toledo, Ohio
Trenton, N. J.
Tulsa, Okla.
Utica, N. Y.
Virgin Islands.
Washington, D. C.
Wichita, Kans.
Wilmington, Del.
Wheeling, W. Va.
Worcester, Mass.
Youngstown, Ohio.

SURPLUS LUMBER SALES UNDER NEW REGULATION

Sales by private owners and by the government of almost all surplus lumber, except used lumber, have been brought under a new regulation, fixing prices at levels now prevailing for producing mill sales, plus a transportation allowance, the Office of Price Administration announces.

Hardwood plywood, ship oak and a few other items not likely to be found in surplus stock are omitted from the new regulation. All sales of privately owned surplus lumber, amounting to $50 or less are exempted from price control.

Sales of $300 or less by the government, government contractors or government agents, which were exempted under an earlier action, are still exempt. OPA

(*Continued on page* 310)

SCOPE*

The *Mastergauge* line

—Marsh accuracy and stamina at its highest. Mastergauges are made in pressure ranges up to 10,000 lbs.; also in compound (vacuum and pressure) types and as altitude gauges. A full range of case patterns is available.

Single Spring Gauge

Auxiliary Spring Gauge

Double Spring Gauge

Standard Gauges

The standard line of Marsh gauges is made in single spring type for ordinary service; auxiliary and double-spring types for fluctuating pressures or where extreme vibration is present. Many ranges, 0-15 to 0-2000 lbs. Full range of cases.

Standard Vacuum Gauge.

Standard Compound Gauge.

Pressure and Altitude Gauge

Sprinkler Gauge

Hydraulic Gauge

Ammonia Gauge

Maximum Reading Gauge

Diaphragm Gauge

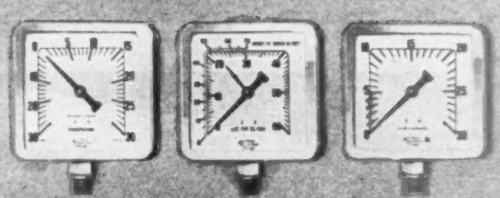
There is a pressure gauge for every purpose in the broad Marsh Line

No less important than the time honored precision and accuracy of Marsh Pressure Gauges is the scope of the Marsh line. There is a Marsh Gauge for every pressure medium; every pressure range; every service condition—a style and size of case for every application and mounting.

Space permits showing only a part of the regular line of Marsh Gauges —and beyond these stock types are the hundreds of "specials" that have been developed for manufacturers who use gauges in quantities.

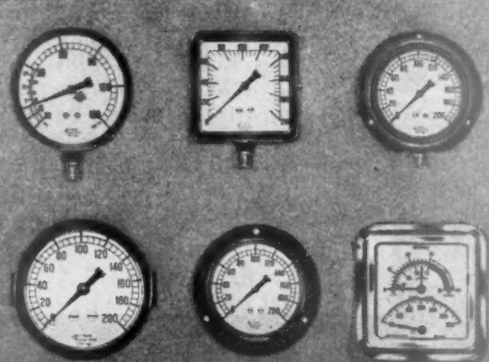
Whatever your requirements there is a Marsh Gauge that will fill them . . . *better.*

JAS. P. MARSH CORPORATION
2054 Southport Ave., Chicago 14, Illinois



House heating gauges (A.S.M.E. standard) in all types: Low pressure steam gauges; compound gauges; combination pressure and altitude gauges; retard gauges; pressure, altitude and thermometer combinations, etc.

CASES OF ALL KINDS. Just a few are illustrated below—



MARSH GAUGES

DIAL THERMOMETERS
HEATING SPECIALTIES

*One of a series of advertisements high-lighting the factors that make Marsh instruments "THE STANDARD OF ACCURACY"

LOOK TO TRIPLEX

for Cap Screws in ALL HEADS

Up to 8" Long and 1" Diameter

Get your *complete* cap screw requirements now in TOUGH TRIPLEX quality. This includes Flat, Fillister, Button and Hex heads. All diameters up to 1 in. Lengths up to 8 in. Don't overlook the importance of free-running threads in *saving assembly time.* That's a plus value you get with TRIPLEX toughness. WE MAKE IMMEDIATE SHIPMENT FROM STOCK ON MANY SIZES.

ARMY E NAVY

Write for new wall chart. It's the handiest buyers guide you ever saw.

THE TRIPLEX SCREW COMPANY
5331 GRANT AVENUE CLEVELAND 5, OHIO

TRIPLEX THREADED FASTENERS
CAP AND SET SCREWS · BOLTS NUTS AND RIVETS

(*Continued from page* 308)

said, and used lumber remains under the coverage of a regulation permitting community dollar-and-cent ceilings.

This action, effective December 3, 1945, will have little total effect on present consumer prices of surplus lumber, OPA said, since sales by saw mills and concentration and distribution yards, principal sources of supply to consumers, are not affected by the new regulation.

Source of Lumber

Most the lumber affected by the action will be that left over as a result of termination or cancellation of government contracts, OPA said. In any case, to qualify as surplus the lumber must have been bought for use and not for resale.

Sales governed by the new regulation formerly were governed by a number of separate regulations, OPA said. Prices for surplus lumber sold by persons or agencies other than commerical sellers were in most cases approximately the same as those set today, the price agency said.

Under the new regulation, owners have the option of selling "f. o. b. present site," "where is." or delivered to the destination specified by the buyer. In the first case, the ceiling price is the f. o. b. mill price as determined under the regulation applying to mill sales of the species of lumber involved, plus a transportation charge, and seller must provide loading service upon the conveyance which will transport the lumber to the buyer. The transportation charge in each case may not exceed the freight rate from the basing point, as defined in the new regulation, to the rail receiving point nearest the present site of the lumber, and further reduced by the cost of transportation to the loading out point.

A "Where-is" Sale

A "where is" sale is one in which the seller does not move the lumber to a loading-out point, or offer any handling service. In such sales, the f. o. b. site ceiling price must be reduced by $1.50 per 1,000 board feet.

On delivered sales, the seller may add to the f. o.b. site ceiling an amount for outbound freight. Tables for computing outbound freight charges are given in the regulation, and differ as between hardwood and softwood and green and dry lumber, OPA said. If delivery is by truck, allowable transportation charges are given in dollar-and-cent on a mileage basis.

Surplus lumber affected by this action includes:

Northern and northeastern softwoods, southern pine, tidewater red cypress, western pine and associated species, Douglas fir and other west coast lumber, Sitka spruce, redwood, western red cedar; softwood plywood; northern, northeastern, appalachian, central and southern hardwood lumber; aromatic red cedar and walnut lumber and gunstock blanks; and western softwood shingles.

(Maximum Price Regulation 603—Surplus Lumber)

MAINTENANCE COSTS SOARED BECAUSE OF MANY POWER DRIVE FAILURES

then installation of a

DAYTON V-BELT DRIVE ELIMINATED BREAKAGE

and paid for itself in 3 months

Driving this pulp beater is a tough job and the original drive couldn't take it . . . broke frequently. Then 13 Dayton V-Belts were put to work, utilizing the existing large flat pulley. They have operated continuously without any breakage. Not only did the savings in belt costs pay for the Daytons in three months time, but additional important savings resulted because production is not now interrupted. Dayton V-Belts correct such power transmission drive difficulties easily because they are engineered for their job as a result of 40 years of experience working with natural and synthetic rubber. They can help to solve your power drive problems just as easily. Write for full information today.

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ATTENTION POWER TRANSMISSION ENGINEERS:

There is a mill supply house near you that stocks Dayton V-Belts. Look for the name under the trade name listing, "Dayton V-Belts", in the yellow pages of your telephone book.

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SEND FOR YOUR COPY OF THIS DAYTON CATALOG:

With a Dayton No. 280 Catalog you can quickly and easily select the V-Belt requirements of any power transmission drive. Your copy is free. Write for it today. The Dayton Rubber Mfg. Company, Dayton 1, Ohio.

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A Good Year To Do A Little "IRONING"

When the present "back log" of orders is taken care of, old-fashioned competition will take over. Merit, not mere availability, will then govern buying, and it will be rough going for mediocre merchandise. Now is the time to "iron out" any kinks in your product design. If this can be effected by a change in basic material, you will find it worth while to investigate the following SEYMOUR Products:

LET THIS "BIG 4" HELP IRON OUT DESIGN & PRODUCTION TROUBLES!

SEYMOUR NICKEL SILVER

A wide ductility range makes it the perfect alloy for spinning and drawing.

Its silvery white color makes it an excellent base for plated ware.

Has the ideal uniform grain for the etching process.

Leaded for free cutting, it has unsurpassed workability.

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High corrosion resistance solves most salt water and dampness problems.

Remarkable fatigue resistance.

Fine resilience, producing springs of almost endless life.

Extreme toughness makes it highly dependable for small bearings.

SEYMOUR NICKEL ANODES

Made of virgin nickel electrically melted.

Cast under accurate pyrometric control and constant laboratory control.

Special grain structure reduces sludge and loose nickel. Made in all standard shapes and formulas. Special anodes to order.

SEYMOUR PHOSPHOR BRONZE WELDING RODS

For homogeneous welds of high tensile strength. Clean melting, good penetration.

Result of over 60 years in the manufacture of nonferrous alloys.

In grades A, C and D at most welding supply houses.

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NONFERROUS ALLOYS SINCE 1878

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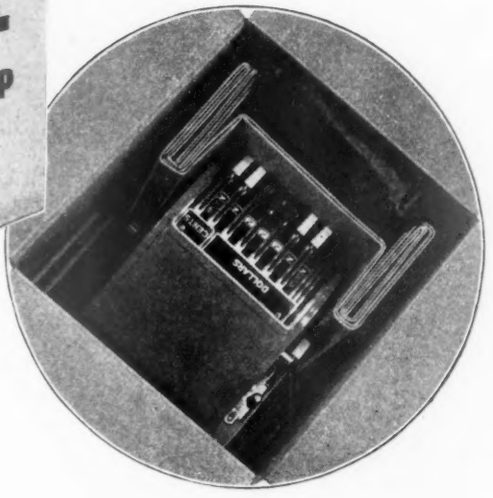

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MFGRS. OF CHECK PROTECTING MACHINES

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● The Paymaster Check Protector is a good example of careful designing by Inland Package engineers. Correct balance, proper bracing, and ease of handling assure safe delivery. Your products too will receive the same careful consideration which will enable them to be shipped successfully when they are in a

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. . . cut production costs . . . 4 WAYS!

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Sound design, volume production and manufacturing know-how keep W-T prices low.

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Compact, rugged construction, elimination of unessential weight, keep power and maintenance costs low.

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Selection of correct cutting speed for each material provides maximum cutting efficiency.

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Adaptable to a wide variety of operations — in standard or special set-ups in single or multiple installations — solving troublesome tooling problems at low cost.

WALKER-TURNER COMPANY
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W. T. RADIAL DRILL

Speed ranges — 110 to 8300 R.P.M. Head tilts 45° each way. Price $352.50, less base and motor. Slightly higher west of Rockies and in Canada.

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DRILL PRESSES — HAND AND POWER FEED • MOTORS
RADIAL CUT-OFF MACHINES FOR METAL • FLEXIBLE SHAFT MACHINES • BAND SAWS • POLISHING LATHES
RADIAL DRILLS • BELT & DISC SURFACERS

Duly Scrapped As Obsolete

Priorities Department of Philadelphia Company Say Goodbye To Wartime Rubber Stamps

The Priorities Division and the rubber stamps that were scrapped. Left to right: Ray C. Hostler, Emma Boeh, Lottie Elliott, George Scheffel, Roy Adams, and R. C. Wenz, General Purchasing Agent.

As with industrial purchasing departments throughout the nation, the termination of the Government priorities and allocation system was more than a news item to employees of the Purchasing Department of the Philadelphia Company, Philadelphia, Pa. Since 1941 it has used over 200 rubber stamps on purchase orders in the form of certificates, extension of preference ratings granted to the Companies under "U", "P" or "L" orders, or approved projects and allocation numbers assigned under CMP or the allocation numbers in use and effect at the time the department operated under PRP.

The photograph indicates that a sizeable collection of stamps accumulated, now duly scrapped as obsolete.

R. C. Wenz, General Purchasing Agent for the Companies, said:

"Our first reaction to the elimination of the stamps and the rules connected with them was—good riddance—happy days, etc., but as many of operating men already know, these same rubber stamps were the means of keeping the material flowing our way during the war emergency. Without our priority assistance and allocations of controlled material, our various operations would have come to a standstill."

At the present time, the Purchasing Department is without this priority assistance, and during the adjustment period, it and its suppliers are going through a rather rough period. Shipping promises on same standard items are expressed in terms of "months" instead of the standard "weeks." It takes a minimum of seven weeks to obtain a shipping promise on steam and stoker parts. Light castings are practically off the market until foundry workers are more plentiful. Ceramic materials have lost ground until now when the Companies' requirements have to be anticipated six months ahead of use.

Advance commitments must be made for copper wire, cable, steel rails, ties, and hundreds of items. Some schedules run through the four quarters of the year 1946. This does not mean that they are stocking more material than is needed.

Mr. Wenz is hopeful that the year 1946 will bring a more plentiful market and an approach to normal conditions.

* * *

WAR DEPARTMENT MOVES TO RESTORE BUYING TO PEACETIME BASIS

A new procurement regulation calling for increased use of sealed-bid, fixed-price contracts, was put into effect January 26th by the War Department in a move to restore procurement and price policies to a peacetime status.

Chiefs of the Technical Services and the Air Forces are instructed by the order to use the prewar system of sealed-bid, fixed-price contracts, whenever practicable. Negotiations are to be used only when the costs to the Army will be lower than the results of advertising for bids.

This results in the following price pattern for Army procurement contracts:

(1) Coal, basic steel mill products, lumber and petroleum in the first state of refining will continue to be purchased under contracts including automatic escalator clauses providing for changes in the contract price in accordance with changes in the OPA ceiling prices.

(2) Some contracts for other items will continue to include a clause for price revision negotiation. This clause is used only in negotiated contracts and in most cases at the request of the contractor.

(3) Some of the negotiated contracts and all of the sealed-bid contracts will be fixed price agreements.

It is not now felt that any change in policy to provide for greater price flexibility will be necessary. Price revision negotiation has been favored by the Army

(*Continued on page* 316)

PRODUCT IMPROVEMENT THROUGH

DURONZE* III

Patented automatic line splice, courtesy of Fargo Manufacturing Co., Poughkeepsie, N. Y.

Are Your Metal Specifications Up to Date?

Product designers and engineers are placing increasing emphasis on the dependability of materials which must stand up under severe service conditions. It will pay alert manufacturers to study the fine engineering characteristics of Duronze III in the interests of producing high strength, corrosion resistant vital parts quickly and economically. Duronze III is adding longer service life to pump and valve parts, screw products, nuts, wire and cable connectors, pole line hardware, oil burner nozzles, gears, builders' hardware, automobile thrust screws and many other items.

Duronze III (silicon aluminum bronze) is one of a number of fine alloys available to industry. It is supplied in rod form for making either screw machine parts or high strength hot forgings. Duronze III and other engineering alloys such as silicon bronzes are described in Bridgeport's Duronze Manual, which can be obtained by writing on company stationery. To help in the selection of the material which will be most suitable, call on our Technical Service Department by contacting our nearest branch office or warehouse.

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JOHNSON Wire
SPECIAL ALLOY FINISH
New smooth satin alloy finish—resistant to corrosion and rust—acts as lubricant reducing tool wear. Withstands 700° Fahrenheit. Highest tensile without disrupting physicals. Here's a major development — a better coating than tin, and no restrictions. Sizes .003" to .080".
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COATING
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QUICK SERVICE

Quality for 65 Years

ADHESIVE TAPES
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BACKING CLOTHS
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ADHESIVE and chemical mix coatings expertly applied to paper, cloth, foils and other materials.

Fabrics backed, laminated or combined to your specifications, and special purpose formulas developed in our own Laboratory.

65 years of "Know-How" deliver "Use-Proved" tapes and backings deserving the enthusiastic approval they earn on the production lines.

Just tell us what your problem is and let our Laboratory, backed by their years of specialized experience in synthetics, help you find the perfect solution.

Let Mr. George L. Peters, E.M., Columbia 1911, head of our Engineering Staff, suggest from our formulas those experience indicates as best suited to your particular needs.

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RUBBER COMPANY, INC.
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ESTABLISHED 3 GENERATIONS

(*Continued from page* 314)

over use of the automatic escalator clause because of the conviction that in many cases higher costs of one component of a product can be absorbed by other economics by efficient management.

Furthermore, Government procurement is based on budgetary control provided by current appropriations, and accordingly the range of price flexibility that may be covered in purchasing contracts is limited.

Procurement officers are instructed to use the sealed-bid method in cases where an ample supply of the item is available for both military and civilian requirements, and where competitive bids will be made.

Exceptions to the general policy are provided in the case of small contracts, payment for personal services, emergency purchases, buying for secret projects or experimental work, and all those items for which the Undersecretary of War determines that the cost to the Government would be higher when purchased by bids than when purchased by renegotiation.

HALF OF SURPLUS PROPERTY AIRCRAFT AND PARTS

Half the total property expected to be surplus by June 1946 will consist of aircraft and aircraft parts which originally cost the government more than 17 billion dollars, it was revealed in a Report to Congress by the Surplus Property Administration.

The bulk of this surplus will be made up of obsolete combat planes and all the engines and spare parts that go with them. This equipment is practically useless in civil aviation and today has only scrap value.

The aircraft report outlined the program for the disposal of surplus aircraft and aircraft parts. This program has been developed for more than a year and a half and now is in operation.

The report points out the interrelationship between surplus aircraft disposal and the need for maintaining the excellence of American aviation, high levels of postwar employment and the future of American air power. To meet these objectives, the aircraft disposal program provides for orderly disposal at reasonable prices; the utilization of normal trade channels wherever possible; the development of foreign markets; the use of surplus aircraft in schools and colleges and for scientific experiments; and the prompt scrapping of all unsalable aircraft in order to minimize the cost of care and handling.

The report divides surplus aircraft and aircraft parts into four classes:

(1) *Tactical planes.* These are bombers, fighters and heavy trainers. Except for the limited demand for educational and experimental purposes, they cannot be sold for civil use and will be automatically salvaged of valuable parts and the remainder relegated to the scrap heap for future use as metal.

(2) *Transport planes.* These have

(*Continued on page* 322)

Proved!

Every Woodworth product must conform to the basic policy of the N. A. Woodworth Company — to produce only the most accurate tools and gages with longest possible service life at lowest initial and operating costs.

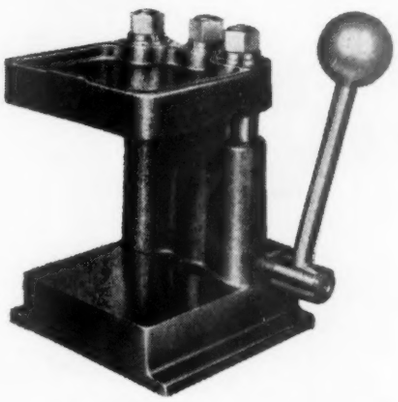
That is why Woodworth precision tools and gages must first be pre-tested—PROVED — in our own laboratories.

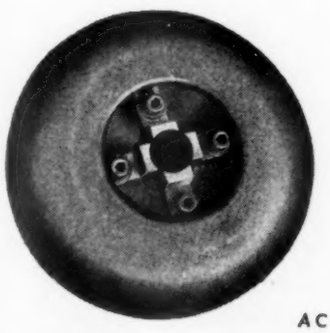
That, too, is why they're continually PROVING themselves in actual production—adapting themselves to an ever greater variety of difficult industrial applications.

1. Speed up production and reduce costs with Limitrol. The Limitrol Comparator Type Snap Gage checks errors involving pitch diameter, lead, taper, angle, out-of-roundness. It eliminates "feel" and reduces scrap. Write for Folder 44-L.

2. Woodworth has made an enviable reputation in industry with its long-life thread, plug and ring gages made of such wear-tested materials as steel, Durplate, Norbide, Carboloy, Stellite and Nawlide. Write for Catalog 44-G.

3. The Woodworth "Cone-Lok" Jig for instantaneous positive clamping action is rugged, adaptable, mechanically simple. Fully sealed-in lubrication. Low maintenance cost. Wide range of sizes in three styles. Write for Catalog 45-J.





4. The new Woodworth Diaphragm Chuck — speedy and accurate — for precision grinding, boring and turning operations. Steps up production 2½ times. Eliminates "scrap." Write for Catalog 45-C.

Bridge Type Jig for heavy duty.

All Purpose Jig for general machine shop work.

"Up-Clamp" Type Jig for close tolerance work.

The Cone-Lok fixture clamp and Cone-Lok unit use the same principle and are available for special jigs and fixtures. Ask for data sheet.

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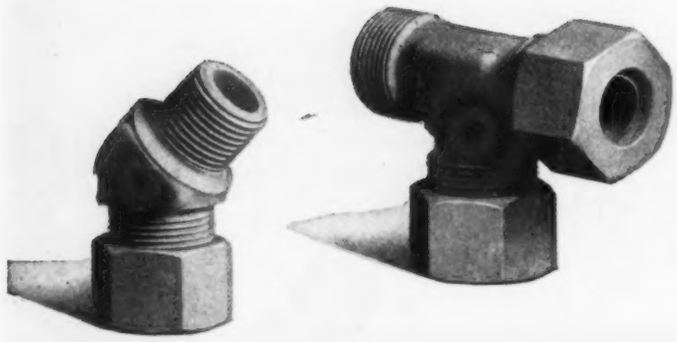

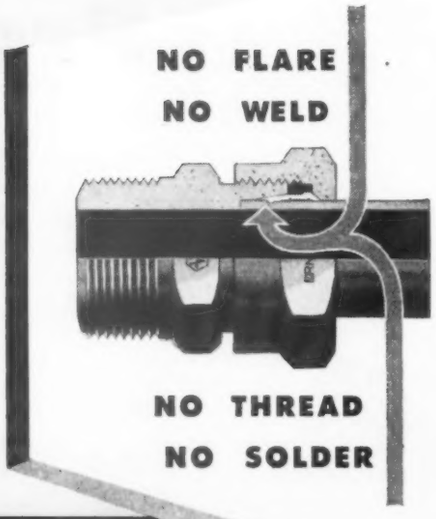

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Weatherhead Ermeto fittings are made in all sizes and types. They can be furnished in O.D. tube or in nominal pipe sizes from ⅛ inch to 2 inch O.D. Ermeto fittings for special installations are also available for a wide variety of uses. These fittings have been field tested and approved in thousands of installations on hydraulic, oil, water, gas and fuel lines. They will withstand excessive vibration for an indefinite period and hold beyond the burst strength of the tube itself. For information or literature, write or phone any Weatherhead branch office.

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A girl can lift it—

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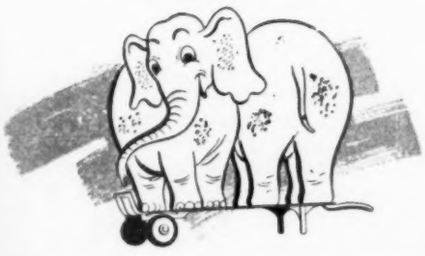

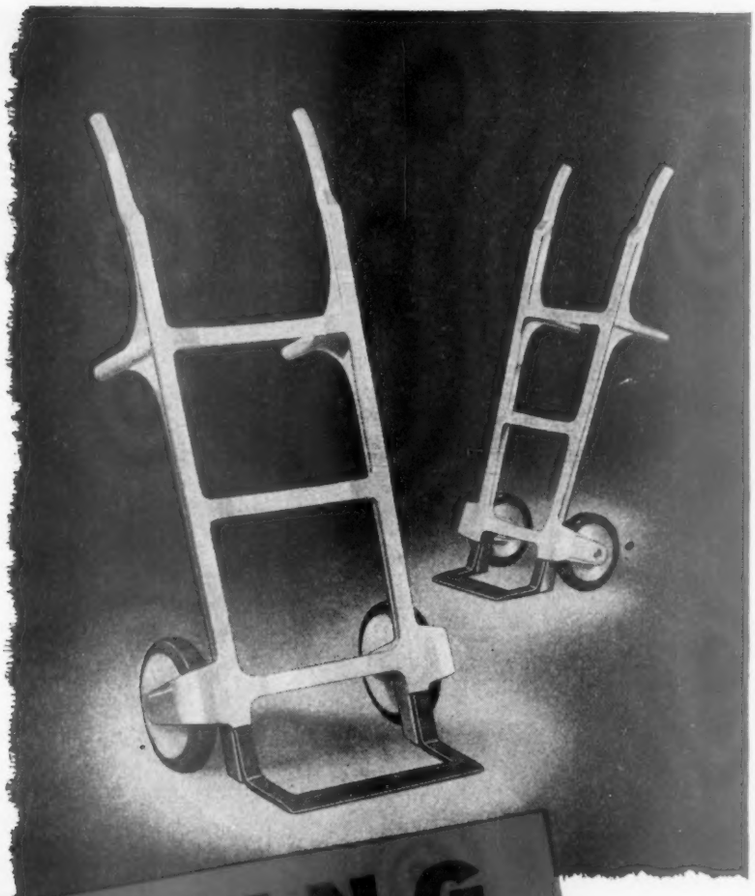

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THE NORTHROP GAINES

Airlight HAND TRUCK

Airlight WHEELS

Airlight high capacity aluminum alloy wheels available in standard sizes for new equipment or replacement service. Details are available at your request.

Here's an amazing new aluminum alloy hand truck that will *speed* up your package and materials handling . . . make hand trucking and stevedoring *easier* . . . save on upkeep . . . improve *appearance.*

So light, balanced, and free-rolling that a girl can handle them effortlessly, Airlight trucks withstand loads far greater than would ever be imposed in service. They are cast from a weldable aluminum alloy that resists distortion and fracture. Under test, they have easily carried ten times a normal load.

You can forget about hand-truck maintenance when you use Airlights. Their aluminum-alloy frames are resistant to corrosion, impossible to splinter. Their smooth surfaces shed dust and dirt. Even more important, their high capacity, noiseless Airlight wheels are designed to operate the equivalent of ten thousand miles *without regreasing.* The special waterproof grease cannot escape from the factory-packed Timken tapered roller bearings even under conditions ranging from subzero to more than 200F.

If you would like complete information on how to simplify your hand trucking and at the same time improve appearances, send for this booklet. There is no obligation. Just write Northrop Gaines, Inc., 1985 E. 16th St., Los Angeles 21, Calif. Dept. P-2

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"Nothing protects like RAWHIDE"

"And there's nothing like CHICAGO Rawhide"

Chicago Rawhide hammer faces of coiled rawhide may be quickly replaced in the permanent malleable iron heads.

You can't beat rawhide. Mallets and Hammers made from this tough resilient material deliver the *most* power with the *most* protection . . . preserving fine finishes and expensive machinery.

And *Chicago* is the best in *Rawhide*. Carefully selected hides . . . special seasoning and manufacturing processes . . . Chicago Rawhide's 58 years experience—all give you unduplicated assurance of top-notch resiliency and durability. Always ask for *Chicago* Rawhide Mallets and Hammers.

CHICAGO *Rawhide* MFG. CO.

1300 ELSTON AVE. ★ CHICAGO, ILLINOIS.

CANOES, ROOFING AND RAILROAD CARS OF ALUMINUM

With the aluminum production capacity in the United States twice the total world consumption in 1939, the nation's aluminum industry is putting into effect intensified 1946 sales campaigns to promote the greatest possible use of the metal, states Roy A. Hunt, president, Aluminum Company of America.

Aluminum emerged from the war a better metal for many new purposes, and is now available at the lowest price in history. Manufacturers and fabricators plan to take advantage of these conditions to utilize efficiently not only the enlarged production facilities for primary aluminum but the heavy supply of scrap now available. Estimates of the supply of aluminum scrap range from one to three billion pounds.

Alcoa looks forward to sharp expansion in its sales force and distributing program. The company has recently opened 11 new regional sales offices and is planning to open 5 more, some in areas where Alcoa previously had no direct sales representation.

As evidence of the growing acceptance of aluminum for new applications, a trend the industry hopes to accelerate during the coming year, the industry will depend for volume, in part, upon applications comparatively little known till now in a number of the nation's largest industries. New types of roofing sheet to tap a tonnage market are now being introduced to the building industry, and should account for hundreds of millions of pounds. A new aluminum roof now nearing completion for the Union Terminal at Cincinnati will require 85,000 pounds of the metal.

The nation's railroads, seeking modern, more attractive and lighter equipment, are specifying aluminum in many applications for 1946. Of 1,100 rail passenger cars now on order, 160 will be of all-aluminum construction, and the others will average between 2,000 and 10,000 pounds of aluminum per car. Alcoa sales engineers are also calculating the lightening of such specialized railroad equipment as trucks, brakes, air conditioning equipment and lighting systems. Even locomotives in 1946 will employ large amounts of the light metal. The Pennsylvania Railroad has 50 new type locomotives under construction which will average 10,000 pounds of aluminum each for cabs, walkways and boiler coverings. Other transportation, such as trucks, trailers, buses, and airplanes will employ large quantities of aluminum.

Among smaller items already in volume production is a line of aluminum canoes weighing only one-half to two-thirds as much as their counterparts made of other materials. Some of the new packaging applications developed during the war will have postwar applications. Aluminum caps and seals made for penicillin bottles will have peace-time counterparts in packages designed for pharmaceutics, while heat-sealed aluminum foil envelopes used during the war will protect and display such products as dehydrated soups and powdered fruit juices.

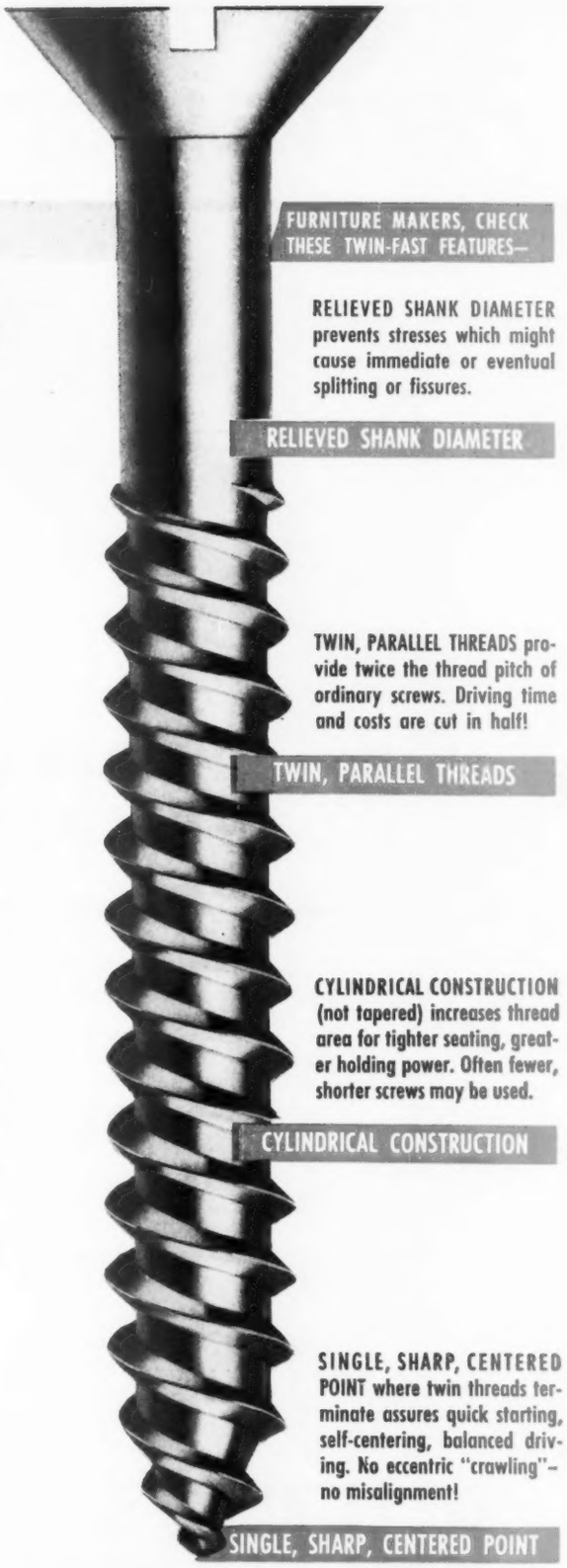
NEWER, BETTER, SPEEDIER FASTENINGS FOR UP-AND-COMING FURNITURE LINES

Restyling is not enough to "make" a new line today. The millions of Americans who plan to purchase new furniture are looking forward to better products. Twin-Fast Screws help you produce better-built home furniture, faster. This modern fastening gives your lines a *plus* in utility—an extra selling feature—a lasting advantage over aggressive competition.

Check over Twin-Fast's four major advances in design. You'll see why this is the one wood screw that's in keeping with up-to-date craftsmanship and production methods. Yet Twin-Fast Screws cost no more than ordinary wood screws. Don't lose time—test Twin-Fast on your own products now. *Send for samples today.*

Twin-Fast Screws come in steel or brass with round, flat or oval heads.

Patents 2,314,390; 2,314,391; 2,373,878; 2,373,948 • Canadian Patents 500,695; 500,696 • Other Pats. Pending


FURNITURE MAKERS, CHECK THESE TWIN-FAST FEATURES—
RELIEVED SHANK DIAMETER prevents stresses which might cause immediate or eventual splitting or fissures.
RELIEVED SHANK DIAMETER
TWIN, PARALLEL THREADS provide twice the thread pitch of ordinary screws. Driving time and costs are cut in half!
TWIN, PARALLEL THREADS
CYLINDRICAL CONSTRUCTION (not tapered) increases thread area for tighter seating, greater holding power. Often fewer, shorter screws may be used.
CYLINDRICAL CONSTRUCTION
SINGLE, SHARP, CENTERED POINT where twin threads terminate assures quick starting, self-centering, balanced driving. No eccentric "crawling"—no misalignment!
SINGLE, SHARP, CENTERED POINT

FOR FASTER PRODUCTION—STRONGER CONSTRUCTION

TWINfast REG. U.S. PAT. OFF.

TWIN THREAD WOOD SCREWS

The Blake & Johnson Company makes many thousands of fastening devices in all standard metals.

THE BLAKE & JOHNSON COMPANY (Since 1849)

WATERVILLE, CONNECTICUT

PERFORMANCE

PROVED IN THE LONG RUN

Blu-Mol High Speed Molybdenum hack saw blades by Millers Falls have long since proved their ability to outrun other blades in continuous production cutting while reducing costs as much as 25% to 50%.

Blu-Mol High Speed blades are now eight years old. Widely accepted by industry, they have set up such notable performance records as this: "68 double cuts on W. D. 1020 Steel Shell Casing 6½" outside diameter, 4½" inside diameter, averaging only four minutes per double cut."

Under controlled cutting conditions, nothing can equal the Blu-Mol Double-Life blade for results and economy. Where time is the controlling factor, the Blu-Mol Single-Edge blade is superior.

A few dollars invested in a trial lot of Blu-Mol blades will prove the savings in time and cutting costs. Write us for complete details today.

BLU-MOL DOUBLE-LIFE

ONE THING IN COMMON—QUALITY

MILLERS FALLS TOOLS SINCE 1868

Hack Saw Blades

MILLERS FALLS CO., GREENFIELD • MASS.

(*Continued from page* 316)

great economic value and are in such demand that they must be allocated. Many military transports, however, will not be suitable for commercial operations and they, too, will be scrapped.

(3) *Personal planes.* Most of this group have already been sold. A number of primary trainers, however, are still available for personal use, training programs and fixed base operations.

(4) *Aircraft components and parts.* This group includes engines, propellers, spare parts, hardware, etc. Probably less than 10 percent of the total will be useable in civil aviation. The remainder will be probably scrapped.

The report outlined in detail the various procedures for selling the types that can be used for civilian and commercial purposes. More than 15,000 planes, largely the small personal type, have already been sold with a return to the government of more than $31,000,000. Few of this type, except for primary trainers, remain in Army and Navy stocks and it is expected that most of them in flight condition can be sold. More than 350 transports, mainly the Douglas DC-3 and C-54, have been sold or leased under an allocation procedure to airlines in this country and abroad.

Disposal of aircraft components and parts, the report said, is the most difficult problem in the whole field of surplus aircraft. Saleable equipment is handled on an agency contract basis with the aircraft industry, but direct sales by the disposal agencies are frequently necessary. The complicated equipment designed for military planes, however, has little commercial utility. As rapidly as possible, this material is being cleaned out of Army and Navy warehouses and offered for sale at the best price obtainable.

Aircraft scrap has been the subject of exhaustive study. The disposal program calls for large scrap fields where obsolete bombers and fighters are flown, lumped into a gigantic "mine above ground." This mine will be "worked" as the metal can be absorbed by the market.

WILL PROSECUTE IMPROPER SURPLUS PROPERTY DISPOSALS

All surplus government property disposal agencies are required to investigate complaints or information from any source indicating irregular or improper disposal of such property, by a regulation announced recently by W. Stuart Symington, Surplus Property Administrator. In any case involving criminality the Department of Justice will investigate and prosecute, the regulation provides.

Subject to the supervision and direction of the Administrator, each agency is charged with responsibility of full compliance of its disposal activities with the Surplus Property Act and the orders and stated policies of the Surplus Property Administration. Each must maintain a compliance organization to investigate

(*Continued on page* 326)

A SERVICE AS RELIABLE AS THE PRODUCTS

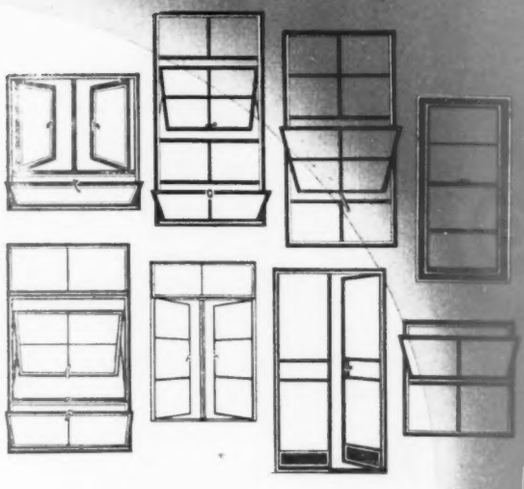
WAREHOUSE
STEEL PRODUCTS

BATES GRATES
OPEN STEEL FLOORING

APS PLASTEEL
ROOFING and SIDING

and now—

THORN
· STEEL · WINDOWS



DURING the war years just past, despite scarcity of materials, manpower shortages and restrictions, Levinson maintained its reputation for reliable warehouse service.

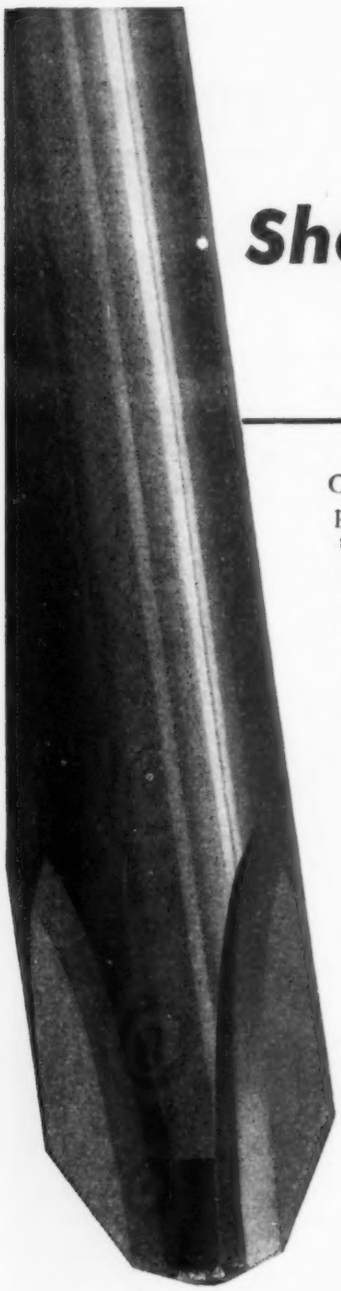
During these years, particularly in the tri-state area, they met the ever-increasing demands for such high-quality products as Plasteel Roofing and Bates Grates.

Levinson has been almost fanatically discriminating in their selection of the products they distribute. No less selective was the choice of THORN Steel Windows, now also being distributed by Levinson Steel Sales Co.

These products, proven by time and performance, are backed by a service as reliable as the products!

LS LEVINSON STEEL

LEVINSON STEEL SALES CO.
Pittsburgh 19, Pa.



"I've run tests and I Know... These are the Sharpest Cost-Cutting Tools that any shop can use!"

Comparative tests of American Phillips Screws with any other type prove: *American Phillips Screws always cost less to use.* Here are some of the reasons:

Easier Handling: 4-winged driver fits firm and straight into tapered recess in screw-head . . . can't twist out. Spiral and power drivers are safe to use on all jobs. No fumbling, false starts or dropped screws.

Fast, Straight Driving: Screw and driver align automatically into one straight driving unit. Starting is faster. Driving is easier. And screws are turned up tight and flush the *first* time, *every* time.

Cleaner Fastenings . . . Unmarred Work: No crookedly driven screws, no split or burred screw heads. And because the driver can't twist out, there are no slashes on work-surfaces, no injuries to workers.

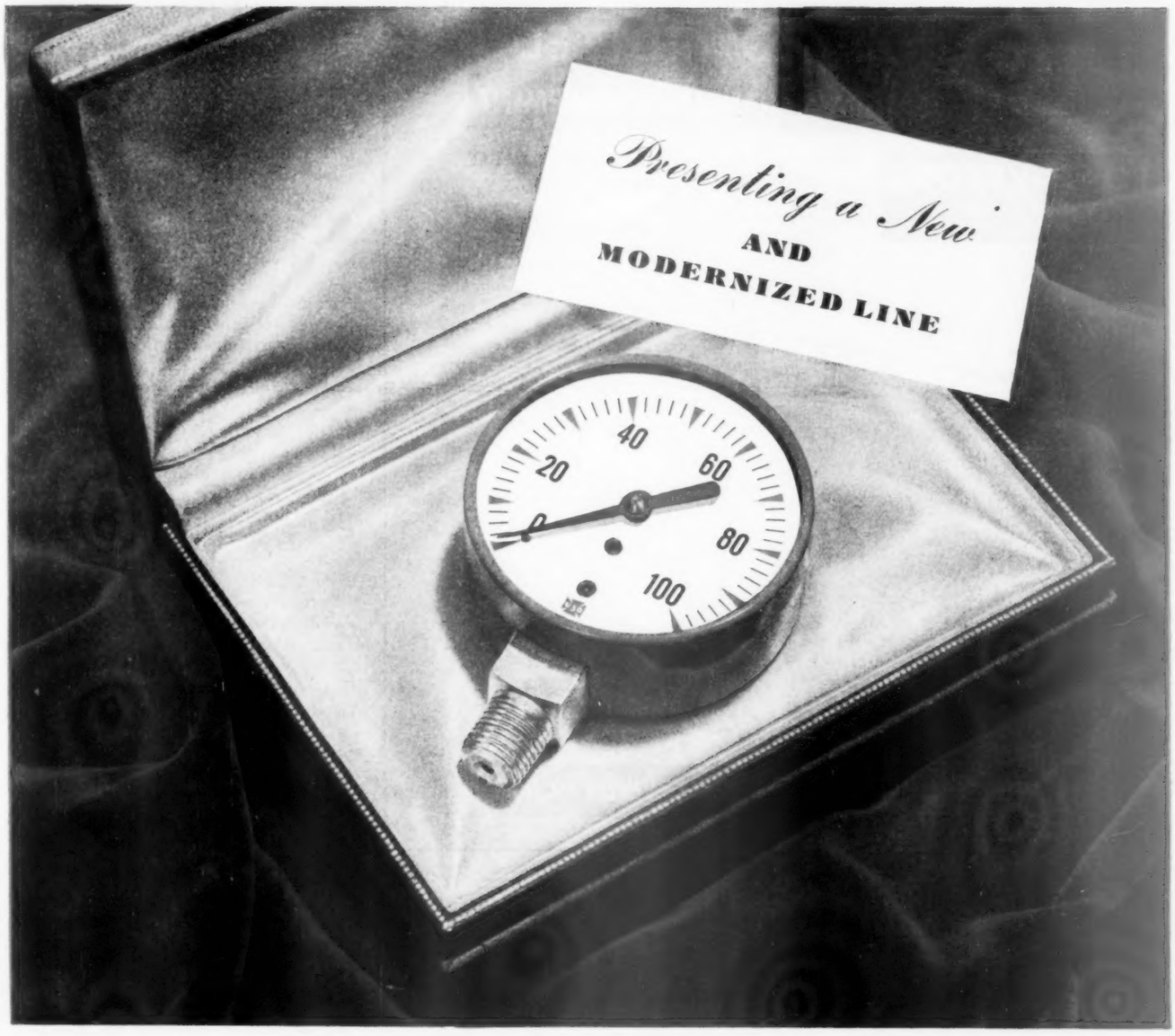
IN SUM: American Phillips Screws save an average of 50% in assembly time.

Today, with assembly costs increased and threatening to go higher, the time saved through the use of American Phillips Screws becomes doubly important. And you get a further saving, too, from American's 4-phase inspection, which gives you a higher "perfection-percentage" in every order for *American* Phillips Screws and Bolts. So start action today, to cut costs the American way.

AMERICAN SCREW COMPANY
PROVIDENCE 1, R. I.
Chicago 11: 589 E. Illinois Street
Detroit 2: 502 Stephenson Building

You've got Thousands to Gain—and Nothing to Lose
WHEN YOU CHANGE TO:

AMERICAN PHILLIPS *Screws*



THE NEW U. S. GAUGES have radical improvements, offered for the first time to industry! Precision accuracy retained as always—but functional styling by one of the country's outstanding designers, in collaboration with our own engineers, has produced a complete line of gauges infinitely superior . . . in *appearance* . . . in *readability* . . . in *sturdy construction*.

Notice the colors, the visibility of graduations, the pleasing lines. Inspect the individual working parts and you will see the product of years of good engineering and research effort, resulting in longer life under adverse operating conditions, and incorporating higher quality and durability.

These significant advances are important to you as a user! For years, 6 out of 10 manufacturers of original equipment have specified U. S. Gauges. This ratio is bound to grow.

UNITED STATES GAUGE, SELLERSVILLE, PA.

USG

UNITED STATES GAUGE

DIVISION OF AMERICAN MACHINE AND METALS, INC.

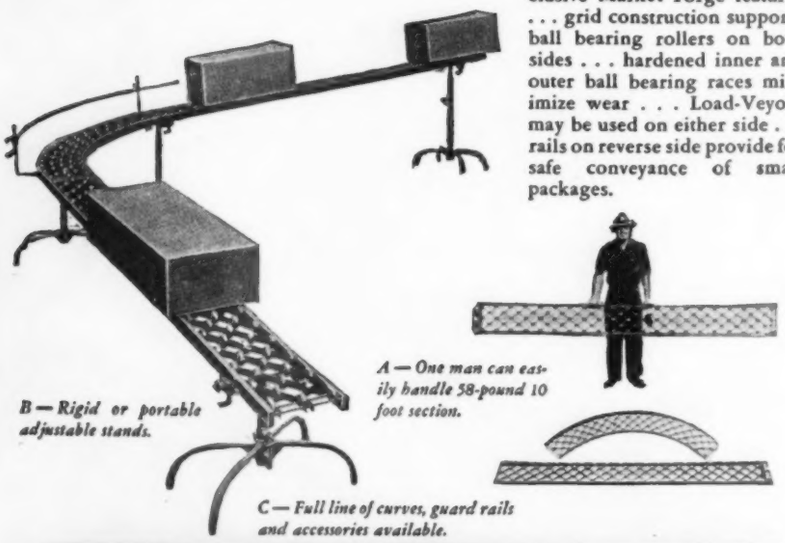
Manufacturers of Pressure, Temperature, Flow and Electrical Measuring Instruments

STANDARDIZED
MATERIALS HANDLING EQUIPMENT

LOAD-VEYORS
SEND FOR LOAD-VEYOR MANUAL No. 1004MH

A MAGIC CARPET FOR INDUSTRY

Load-Veyors combine great strength and light weight. Exclusive Market Forge features . . . grid construction supports ball bearing rollers on both sides . . . hardened inner and outer ball bearing races minimize wear . . . Load-Veyors may be used on either side . . . rails on reverse side provide for safe conveyance of small packages.



A — One man can easily handle 58-pound 10 foot section.

B — Rigid or portable adjustable stands.

C — Full line of curves, guard rails and accessories available.

MARKET FORGE COMPANY, 81 GARVEY ST., EVERETT 49, MASS.

"Extra" Manpower For Your Plant!

Add "extra" manpower to your production and maintenance cleaning staffs by taking advantage of Oakite personal advisory help.

No matter what production or maintenance cleaning tasks you have . . . degreasing, descaling, derusting . . . consult the field-trained men of Oakite's nation-wide service staff. Feel free to benefit from their wealth of wartime experience to meet and solve your problems. You can make use of this Oakite service to help step up production . . . place it on a low-cost basis. You can use it to simplify and speed up ALL your maintenance cleaning tasks.

An Oakite Technical Service Representative is located near you. We'll be glad to have him call at your plant. Write us TODAY . . . there's no obligation!

OAKITE PRODUCTS, INC.
54 Thames St., New York 6, N. Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

70 OVER
Specially Designed
OAKITE MATERIALS
for
PRODUCTION, SANITATION & MAINTENANCE CLEANING

OAKITE
MATERIALS...METHODS SERVICE

Keep Buying Bonds

CLEANING
FOR EVERY CLEANING REQUIREMENT

(*Continued from page 322*)

complaints, make periodic surveys of field unit operations to prevent or correct irregularities and to make such special investigations as the agency itself or the Administrator may consider necessary.

All information indicating violation by any person of a Federal criminal statute or of provisions of the Act against fraudulent practices must be referred immediately to the Department of Justice for further investigation and disposition. After furnishing the Department or any other governmental agency which the Department designates all its information and evidence about indicated violations, the disposal agency will leave further action on criminal aspects to the Justice Department.

Cases involving unfair trade practices will be referred by the agency to the Federal Trade Commission. Where irregularities involve wrong doing by individuals in government agencies other than the one initiating the investigation, the case is to be reported immediately to the Administrator.

Maintenance of complete compliance records and written reports of compliance investigations are also required.

The War and Navy Departments and all owning agencies designated by the Administrator as disposal agencies come within the scope of the regulation, which applies both in the United States and abroad. Not affected, however, is the jurisdiction of the military services over their own personnel or any arrangement between such services and the Department of Justice concerning the handling and prosecution of criminal matters.

"This regulation is designed not only to achieve uniformity in compliance activities but to keep the Administration aware of any undesirable situations that may arise and enable it to take prompt steps to correct or eliminate them," said Mr. Symington.

"The Department of Justice and the Federal Bureau of Investigation will be interested parties in any cases involving criminality and are fully equipped to handle them on a nation-wide basis with efficiency and dispatch."

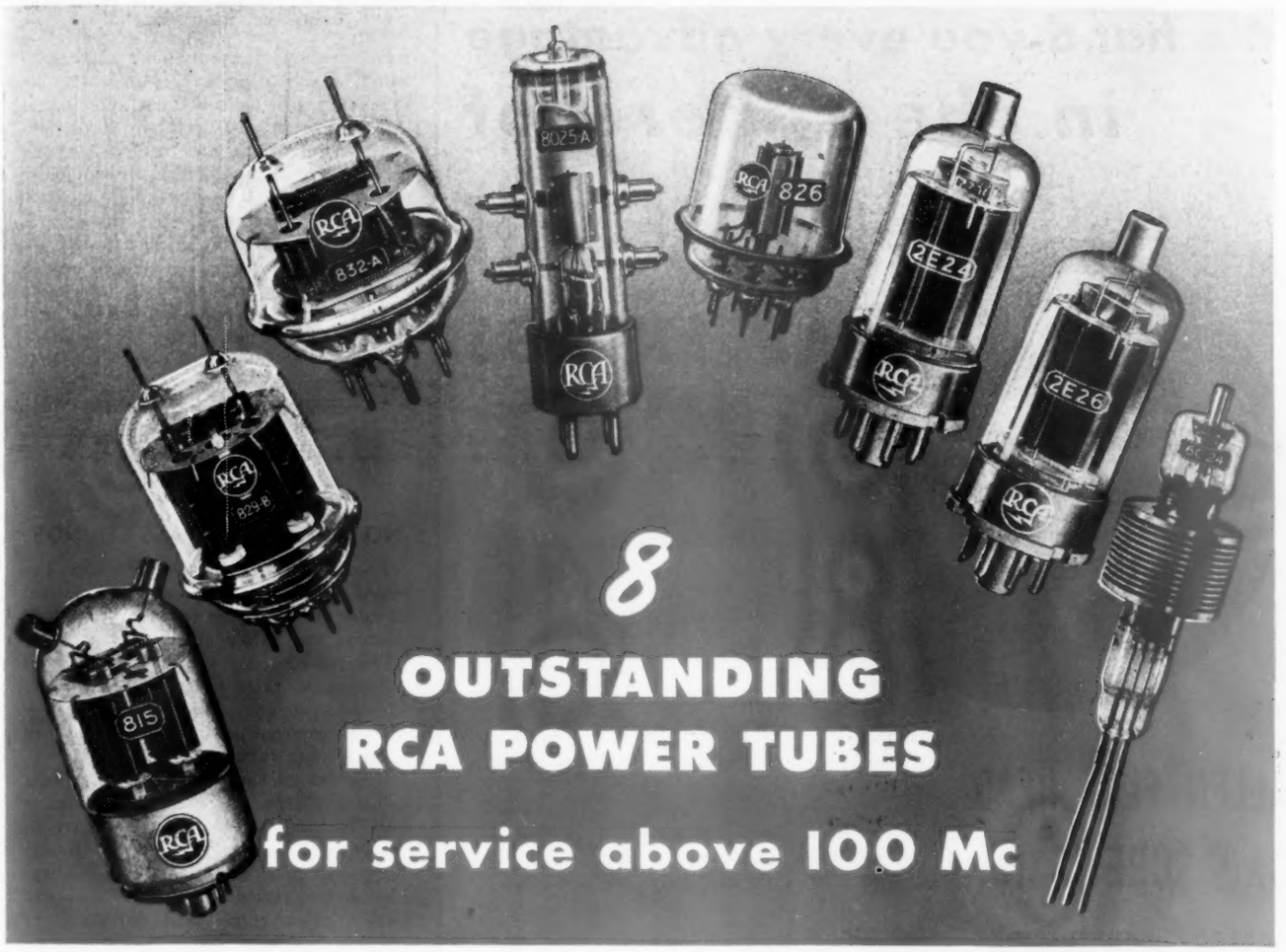
SALES OF COMMODITIES AFTER CONTRACT TERMINATION

Sales of commodities left over after the termination of war contracts can be made at acquisition cost by the Government or by contractors on behalf of the Government only when prospective buyers have been given notice of such acquisition cost, the Office of Price Administration announces.

This action, effective December 3, 1945, puts use of the most common method of pricing war contract termination inventories on a conditional basis, whereas previously it could be used without restriction.

The modification has been made because many buyers were bidding only up to the limits provided by the other op-

(*Continued on page 328*)



Ideally suited to compact transmitter designs for emergency, aeronautical, and other upper-frequency applications

TWIN BEAM-POWER TYPES: The RCA 815, 829-B and 832-A push-pull beam-power tubes offer unusual compactness, combining high-power sensitivity with low plate-voltage requirements. Neutralization is seldom necessary.

SINGLE BEAM-POWER TYPES: The new RCA 2E24 is a quick-heating type for emergency stand-by service. Its sturdy *coated-type* filament reaches operating temperature in less than two seconds. The new RCA 2E26 is a slow-heating type particularly adaptable to FM transmitter designs.

POWER TRIODES: The RCA 826 and 8025-A triodes can be operated with unusual plate efficiency at frequencies as high as 250 and 500 Mc, respectively. Both tubes have a double-helical, center-tapped filament to minimize the effect of filament-lead inductance. The 8025-A has double grid and plate connections that can be paralleled to reduce lead inductance. The new RCA-6C24 high-power triode employs forced-air cooling. Its relatively small size, center-tapped filament, and low inter-electrode capacitances account for its exceptional high-frequency performance.

RCA tube application engineers are ready to consult with you on any design problems you may have involving these or other RCA Electron Tubes. If you wish their services, or additional technical data on these tube types, write to RCA, Commercial Engineering Department, Section D-20B, Harrison, N. J.

COMPARATIVE TECHNICAL DATA
(Plate-Modulated Class C Telephony)

Tube Type No.	Plate Input Watts	Driving Power at Tube	Max. Rating Freq. Mc	Plate Volts	List Price
2E24	ICAS 27	0.2	125	500	$3.50
2E26	ICAS 27	0.2	125	500	3.20
6C24	CCS 1000	75.0	160	2500	45.00
815	ICAS 60	0.2	125	400	4.50
826	CCS 75	6.5	250	800	12.00
829-B	CCS 90	1.0	200	425	17.00
832-A	CCS 22	0.2	200	425	13.00
8025-A	ICAS 33	1.5	500	800	11.00

The Fountainhead of Modern Tube Development is RCA

TUBE DIVISION
RADIO CORPORATION of AMERICA
HARRISON, N. J.

We hand you every advantage in the sphere of FLUSH FASTENINGS

ALLEN FLAT HEAD CAP SCREWS for perfect countersink-fit; positive wrenching

(1) Flush top surface with no gap between screw head and surrounding metal.

(2) Extreme rigidity of grip, because angle of head helps lock screw in place by drawing down on a conical surface.

(3) Firmer hold on thin plates of metal, by more binding surface under the head than in fillister type or cheese-head screws.

(4) Shallower countersink — less weakening of metal — when used for fastening a relatively thin plate.

(5) Positive engagement of hex key transmits power for tightest of set-ups without slipping, reaming or side play.

(6) Maximum strength of screw itself assured by *"pressur-forming"* of special-analysis ALLENOY steel. Threaded to a high Class 3 fit.

(7) Speed in assembly provided for by use of Allen hand drivers and key blades for power drivers.

Order from your local Allen Distributor.

TRADE A MARK

THE ALLEN MANUFACTURING COMPANY
HARTFORD 1, . . CONNECTICUT, U. S. A.

(*Continued from page 326*)

tional method of pricing (use of the existing maximum prices for the particular commodities being sold) not knowing of the acquisition cost method, which frequently provides higher ceilings.

At the same time, OPA made it clear that under one optional method of establishing ceiling prices on war surplus goods generally, namely, by a certification of the buyer that the price paid is not in excess of the ceilings normally applicable on his purchases, no price may be certified on surplus new lumber that is above recently established dollar-and-cent ceilings for such lumber.

(Amendment 7 Supplementary Order 94—Sales by Government Agencies and Resale by Certain Buyers).

NO INCREASE IN BRASS CEILINGS

The Office of Price Administration has denied reports in the trade that a general increase in ceiling prices for brass mill products was imminent.

The price agency added that the brass mill products price situation would, however, be reviewed when additional financial returns from producers are submitted to OPA after January 1, 1946.

Members of the Brass Mill Products Industry Advisory Committee will meet with OPA officials in New York City on Friday, December 7, 1945, to discuss changes in production costs and realizations accompanying changeover from production of wartime brass products to peacetime products. There will, however, be no announcement made following the meeting with regard to prices.

STRATEGIC MATERIALS STOCKPILING REGULATION EXTENDS TO APRIL 1

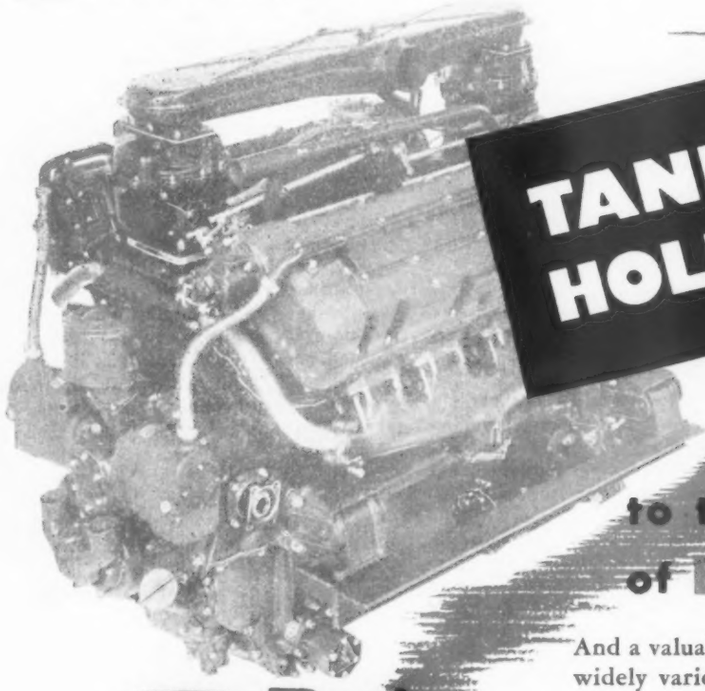
The Surplus Property Administration issued Amendment No. 1 today to Regulation 17, which deals with the stockpiling of strategic materials, extending the expiration date of the regulation from January 3 to April 1, 1946.

Under the regulation, critical and strategic materials needed by the Army and Navy are transferred to the military stockpile, after the essential needs of the civilian peacetime economy have been satisfied. The screening of surplus property to determine which shall be stockpiled is handled by the Reconstruction Finance Corporation. The RFC clears questions of civilian deficiency with the Civilian Production Administration and confers with the Army and Navy Munitions Board which makes the final decision as to what shall be stockpiled.

CANADIAN PULPWOOD IMPORTS

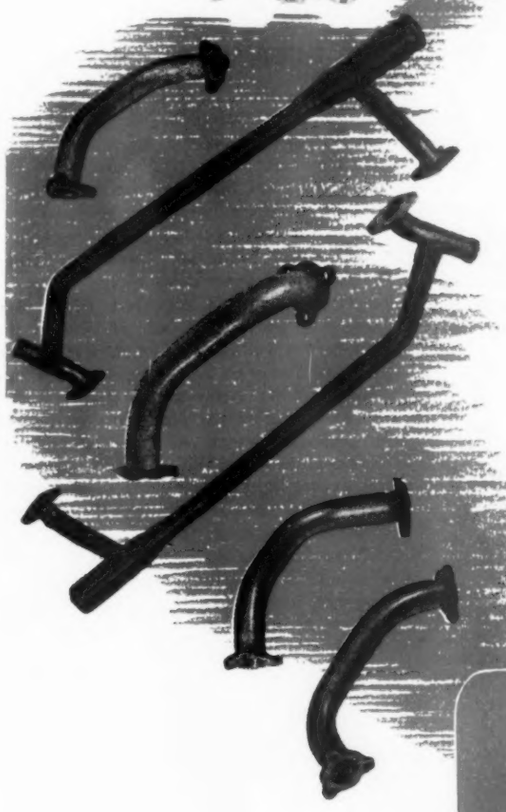
No decision will be reached on supplemental increases of 1946 Canadian pulpwood imports into the United States, above the 1,250,000 cord minimum quota recently established, until the close of

(*Continued on page 330*)



TANK ENGINES HOLD A CLUE...

to the proper selection of ELECTRUNITE TUBING



And a valuable clue it is, too, in pointing out that there are widely varied analyses of ELECTRUNITE Tubing to efficiently and economically meet equally varied application requirements.

This tank engine was built to absorb grueling punishment . . . to "take it" without breaking down. That's why tough, heat-resistant ELECTRUNITE Stainless Steel Tubing was selected to carry hot, corrosive gases from the exhaust manifold to the carburetor heater.

On the other hand, because there was no particular problem of either heat or corrosion in the cooling system, ELECTRUNITE Carbon Steel Tubing was specified as the most economical material for this purpose.

Perhaps yours is not a problem of engine design. But if you use tubing, it will pay you to investigate the wide range of analyses, grades, sizes and shapes in which ELECTRUNITE Tubing is available.

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Bldg., New York 17, N. Y.

Republic
ELECTRUNITE
Reg. U. S. Pat. Off.
TUBING

Mechanical, Aircraft, Stainless Steel and Rail Steel Tubing—Boiler, Condenser and Heat Exchanger Tubes

GRIFFIN

The Blade that Doesn't Shatter. Sag or Bind —

GRIFFIN
Soft Center

HARD-TEMPERED along the back — for reserve strength and stiffness where needed. Softer—but TOUGH —through the center, for flexibility and break-resistance. Extra hard teeth—for sure cutting and long service. A many-purpose hand blade developed exclusively by Griffin to cover widest possible range of uses.

Other Special Griffin Blades

GRIFFIN HIGH SPEED STEEL — For toughest alloys. Hand and power sizes.

GRIFFIN MOLYBDENUM HIGH SPEED—For low-cost cutting of all but very hardest alloys. Power and hand sizes.

GRIFFIN NON-STRIP—Economical hand blade that cuts thinnest sheet or tube without tooth breakage.

Your local Griffin distributor will supply you. If you've a specially difficult cutting problem, consult us — without obligation . . . Write for latest Griffin Blade Price List.

General Sales Agent

JOHN H. GRAHAM & CO. Inc.
105 Duane St., New York 8, N. Y.

GRIFFIN
Hack Saw Blades
MADE BY G. W. GRIFFIN CO., FRANKLIN, N. H. • 1880-1945

(*Continued from page* 328)

the Canadian pulpwood season which usually terminates in June, the Civilian Production Administration announces.

The Civilian Production Administration emphasized that recent public statements that a 550,000 cord supplemental allocation for 1946 was considered likely, were without foundation. This figure, CPA said, was evidently based on the fact that a 550,000 cord supplemental allocation had been made during 1945.

Any decision on the amount of any Canadian pulpwood allocation rests with the Canadian Timber Controller, the Civilian Production Administration said.

Pulpwood is still scarce, according to Canadian reports, largely due to the woods manpower shortage.

* * *

BITUMINOUS CEILINGS INCREASED IN LAKE SUPERIOR SECTION

Retail coal dock operators located along a portion of the Great Lakes shore line have been granted an increase of five cents a ton in their ceilings for bituminous coal, the Office of Price Administration reports.

The increase, effective December 1, 1945, applies to bituminous coal prepared at docks on the United States bank of Lake Superior and the west bank of Lake Michigan north of and including Waukegan, Ill.

Higher mine ceiling prices that these operators have had to pay for their coal supplies since April 30, 1945, necessitated the action.

Ordinarily, retail coal dealers are automatically allowed to increase their ceiling prices when mine prices advance. Retail coal dock operators, however, are excluded from this general provision.

The new ceilings range from 90 cents to $1.60 a ton, depending on the size of coal and the district of origin.

(Amendment 39 to Revised Maximum Price Regulation 122—Solid Fuels Sold and Delivered by Dealers—effective December 1, 1945.)

* * *

AUTHORIZE DONATIONS OF ABANDONED SURPLUSES TO TAX EXEMPT INSTITUTIONS

The Surplus Property Administration issued Regulation 19 governing the destruction and abandonment of valueless government owned surplus property and authorizing donations of such property to tax exempt institutions.

The regulation will enable agencies and institutions operated by federal, state or local government, nonprofit educational and charitable institutions to acquire such property if they are willing to pay for the cost of packing and shipping.

The regulation also authorizes property donations of value under laws other than the Surplus Property Act of 1944, subject to the approval of the Federal Security Agency. The Federal Security Agency will act in an advisory capacity on donations made under the regulation, but final authority rests with the SPA.

Any property originally produced or donated by the American National Red Cross for any government agency may be returned if the Red Cross requests it and it is to be used solely for charitable purposes.

Abandonment and destruction of government surpluses that cannot be disposed of by donations to tax exempt institutions is also authorized under the regulation. Unsaleable or totally unuseable property such as the residue of stripped and demilitarized combat equipment and military material may, at the discretion of the disposal agencies or the Army and Navy, and under the direction of a "reviewing authority" be destroyed or abandoned.

Property cannot usually be destroyed or abandoned until 30 days have elapsed following the publication of the intent to dispose of property by destruction or abandonment. No methods will be used which will be detrimental or dangerous to public health or safety and which will cause an infringement of the rights of others.

Property can be destroyed or abandoned by an owning agency without public notice if approved by the reviewing authority that the immediate destruction was required or desirable because of its nature or because of the expense of its care and handling.

* * *

STARTS DETERMINE FLUORESCENT LAMP LIFE

Developments continue to appear in the fluorescent lamp family at the high rate consonant with still young devices. The fluorescent lamp is less than ten years old. Yet the fact that about forty million of them were made last year (1945) is indicative of their popularity.

The first important variations from the familiar cylindrical shape of fluorescent lamps have appeared. A circular lamp has been developed. It is an even foot across and is rated at 32 watts. Because of the high light output in a small space and its symmetrical shape, it removes the principal obstacles to its use in portable lamps in the home. The Westinghouse Circline is now appearing as the light source in floor and table lamps and in other specially-designed household lighting units.

New fluorescent lamps are longer and slimmer. Four lengths—five-eighths and one-inch in diameter—are standard, from 3½ to 8 feet long. Their special place in the lighting picture is for showcase and decorative lighting where long lines of low brightness are required. Long lamps present a starting problem in humid air which is overcome on the "slimline" by painting a narrow silver stripe along the outside of the glass to within a short distance from each end. This metallic stripe acts as a capacitor facilitating starting.

The slimline lamp is slightly more efficient in turning watts into lumens than the regular lamps. This is because a large

(*Continued on page* 332)

PEAK PERFORMANCE
• There's a CLEVELAND Reamer for every job. And every reamer that carries the C trademark can be counted upon to finish the maximum number of holes at minimum cost. For peak performance, always specify CLEVELAND Twist Drills, Reamers, Screw Extractors, Arbors, Mandrels, Sockets, Mills and Counterbores.
Telephone YOUR I INDUSTRIAL S SUPPLY D DISTRIBUTOR FIRST!
The CLEVELAND TWIST DRILL COMPANY
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TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES
30 THOMAS ST. NEW YORK
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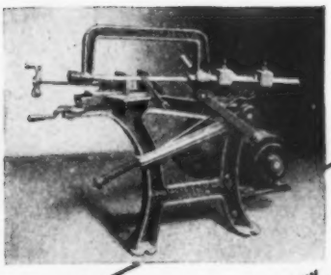
6319 SECOND BLVD., DETROIT
BRUNEL ROAD, OLD OAK COMMON LANE, ACTON, LONDON W.3, ENGLAND
"CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU



80% of all Small Shop Saws are "Marvels"!

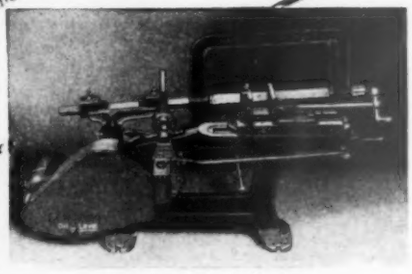
No. 1 Draw Cut Hack Saw Dry cut. 4" x 4" capacity. A sturdy saw well-known for its dependability, economy, and invaluable service in the small shop or shop department. Simple and efficient with low original, maintenance, and blade cost.

MARVEL SAWS

No. 2 Draw Cut Hack Saw. Companion to the No. 1 but with a normal 6" x 6" capacity which can be increased to 8" x 8" by shortening the stroke with adjustable crank. The No. 2 MARVEL also has a swivel vise which is removable from the "T" slotted bed. Permitting special fixtures to be mounted. Both machines are available in belt and motor driven models. Motor driven models can also be furnished mounted on portable truck.

Complete Range of Metal Sawing Machines

Being the largest exclusive manufacturer of metal sawing machines and blades, both hack saw and band saw type, we have the correct answer to your cut-off problems. Each MARVEL model has a distinct application, so write us and we will send our catalog, price, and recommendation for the saw to fill your requirements most efficiently. MARVEL sawing engineers are also available to discuss and analyze your cut-off work. (Without obligation of course)



ARMSTRONG-BLUM MFG. CO.
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"Enclosed picture in our plant proves the DI-ACRO Bender will do a real production job. We are making 4,000 completed parts per day which is competitive to most Power Presses." (Name on Request.)

Here is an example of "DIE-LESS DUPLICATING" typical of a great variety of formed parts readily made with DI-ACRO Precision Machines,— Benders, Brakes, Shears. Picture above shows the finished part formed to die precision. Women operating DI-ACRO units maintain a high out-put on production work.

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Send for Catalog
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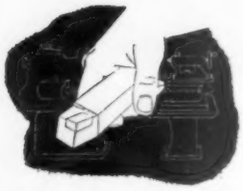

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- **FOR FAST, ACCURATE METAL-CUTTING** . . . complete selection of single-point tools and milling cutters.
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- **WAREHOUSES** in Chicago, Cincinnati, Los Angeles, New York, and San Francisco to expedite delivery.

KENNAMETAL
SUPERIOR CEMENTED CARBIDES
KENNAMETAL Inc., LATROBE, PA.

(*Continued from page* 330)

proportion of fluorescent-lamp losses occur at the ends, and with the "slimlines," for a given length, there is a smaller percentage of loss.

Fluorescent lamp life and the specific effect of starting is better understood. As a result fluorescent lamps are now rated with consideration of the number of starts. For example the 40-watt lamp has a life of 6,000 hours if it burns 12 hours per start. But if the lamp burns 6 hours per start the life is 4,000 hours; for 3 hours per start, the life is 2,500 hours. The efficiencies in percent of initial lumens per watt when the lamp reaches 70 percent of its rated life are 70, 76, and 84 percent under the three conditions above.

Fluorescent lamps decline about 15 percent in efficiency during the first hundred hours and then at a much slower rate for the remainder of the lamp life. This initial decline has been a matter of much concern and some mystery of lamp engineers. Various theories have been set forth, such as a sort of poisoning of the phosphors by mercury vapor. Research at the Westinghouse Lamp Laboratories now definitely fixes the blame at another source. It is caused by the low-wavelength (mostly 1850A) radiation of the mercury-vapor discharge. This short radiation has a damaging effect on the ability of phosphors to convert invisible to visible light. The cure is still not known but at least knowledge of the cause must precede the cure.

* * *

PIPE NIPPLES — PROPOSED STANDARDS REVISION

On recommendation of the National Association of Pipe Nipple Manufacturers, Inc., and with the endorsement of the standing committee, Division of Trade Standards, I. J. Fairchild, Chief, Washington, D. C. is sending to producers, distributors and users for written acceptance prior to publication by the National Bureau of Standards, a Recommended Revision, TS-4024, of Pipe Nipples; Brass, Copper, Steel and Wrought-Iron, Commercial Standards CS5-40.

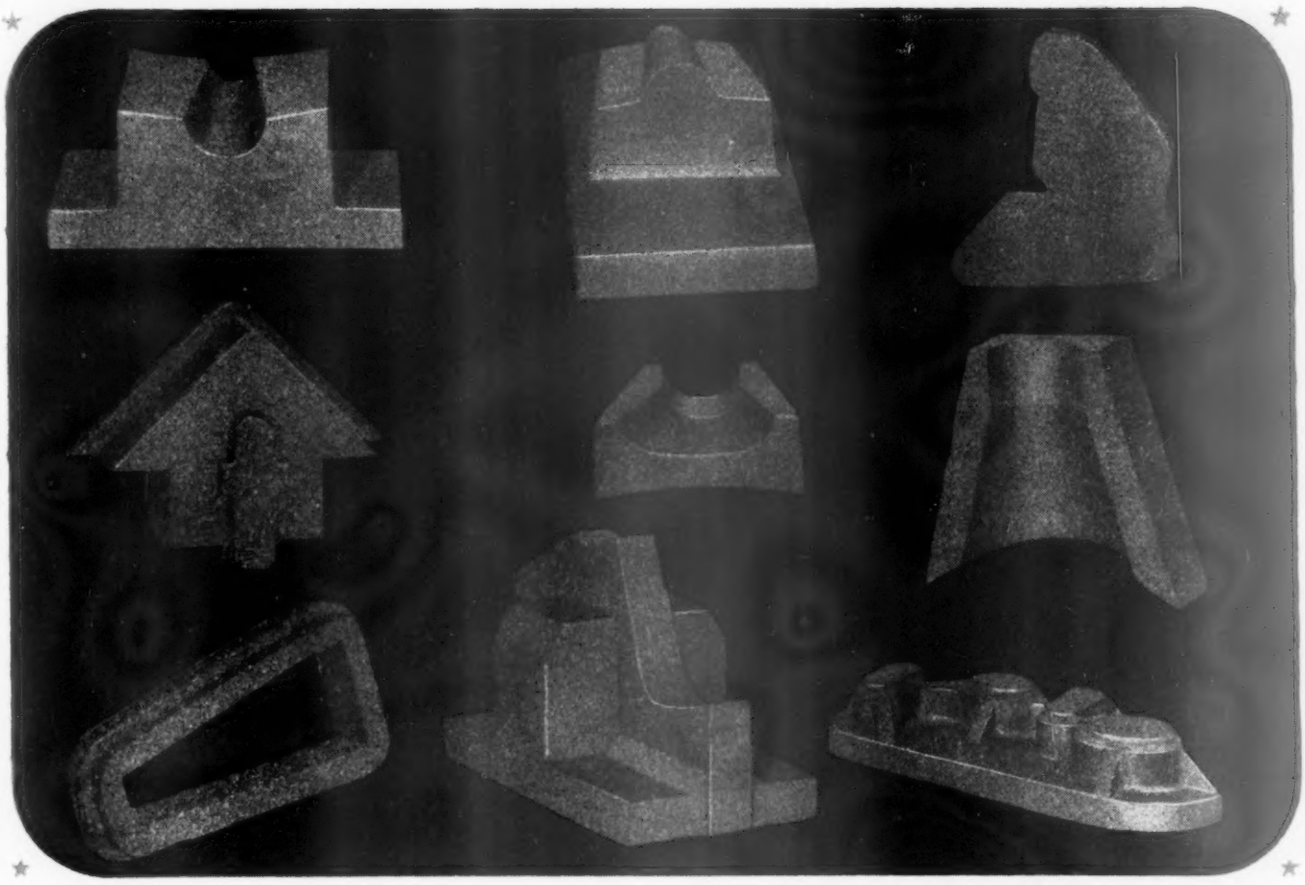
* * *

INDUSTRIAL SUGAR ALLOTMENTS AT SAME LEVELS

Allotments to industrial users of sugar generally will be continued at the same levels for the first quarter of 1946, according to the Office of Price Administration. The only exception is for class 18, percentage of base use for which will be announced shortly. The allotments-percentages of their base period use that industrial user generally will continue to receive during the first quarter of 1946 are: (1) For most industrial users, 5%; (2) For bakers and baking mixes and cereals, 60%; (3) For manufacturers of pharmaceuticals, 110%.

Sugar allowances for canning and bottling citrus juices have been increased from 80 percent of the average number of pounds of sugar used per gallon of

(*Continued on page* 334)



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Even very intricate shapes can now be cast successfully within an eighth inch of finished size. This means that you buy less steel at the start and reduce machining costs substantially.

Tools which could not be made by conventional methods except in sections can often be fabricated from FCC Cast-To-Shape blanks in a single piece.

In many instances performance of the tool is better than can be obtained by fabrication from bar stock or forgings.

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Forging and Casting Division

DETROIT 20, MICHIGAN

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CARRY THE LOAD as Planned

ROLL ON ABBOTT Bearing BALLS
THE ABBOTT BALL COMPANY HARTFORD 10, CONN. U.S.A.

(*Continued from page* 332)

citrus juice in 1941 to 90 per cent of that amount, the Office of Price Administration announced today. Amendment No. 50, Second Revised Ration Order No. 3.

The action, effective December 11, 1945, also permits a provisional sugar allowance for canning and bottling citrus segments based upon the amount of canned citrus segments produced by the industrial user. A provisional allowance, OPA explained, is an amount of sugar allotted to industrial users for each unit of specified products put up rather than an allowance based on the total amount used in 1941.

NEWSPRINT CONTROL INCORPORATED IN PRIORITIES REGULATION 32

Control of newsprint inventories was incorporated in Priorities Regulation No. 32 simultaneously with the recently announced elimination of allocation controls on newsprint on December 31, the Civilian Production Administration announces.

The newsprint order, L-240, covering the distribution and use of newsprint was lifted on December 31. (See CPA Release No. 89 — December 21, 1945). However, the inventory restrictions formerly contained in L-240 are transferred in entirety to Priority Regulation 32 through the issuance of Direction 7 thereto. Direction 7 became effective on December 31.

Under Direction 7, newsprint users in the Eastern and Central States (List A) will be held to a 25-day supply while those in the Southern and Western States (List B) will be permitted not more than 45 days' supply. The number of days' supply will be computed at the average daily rate of consumption for the last six months of 1945. However, any person may hold a newsprint inventory up to 60 tons regardless of the above provisions.

Moreover, in computing the maximum tonnage which a person may have in his inventory on the last day of any month, he may exclude any inventory carry-over which resulted from using less than his assigned quota.

List A

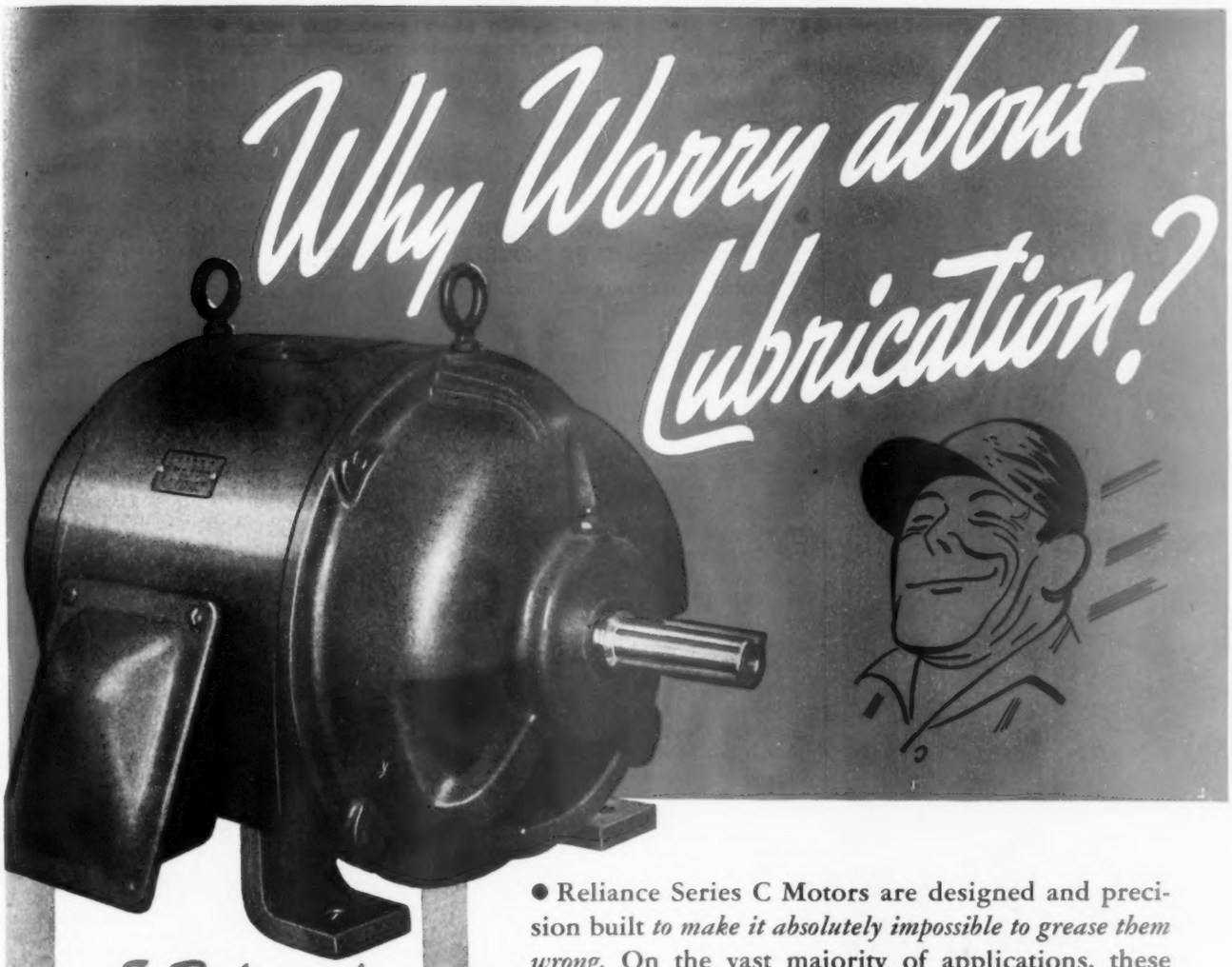
Connecticut	Nebraska
Dist. of Columbia	N. Hampshire
Delaware	New Jersey
Illinois	New York
Indiana	No. Dakota
Iowa	Ohio
Kansas	Pennsylvania
Kentucky	Rhode Island
Maine	So. Dakota
Maryland	Vermont
Massachusetts	Virginia
Michigan	W. Virginia
Minnesota	Wisconsin
Missouri	

List B

Alabama	Nevada
Arizona	New Mexico
Arkansas	No. Carolina
California	Oklahoma
Colorado	Oregon

(*Continued on page* 336)

Why Worry about Lubrication?



8 Balanced Design Features

OF RELIANCE SERIES C MOTORS

1. **Protecting enclosures** keep out dirt, chips, oil, excess moisture.
2. **Steel stators for strength.**
3. **Thirteen-step winding treatment,** for maximum stator protection.
4. **Pressure cast aluminum rotors** provide trouble-free windings.
5. **Heavy shafts,** liberally designed for added strength.
6. **Improved bearing lubrication** affords *real* protection to bearings and windings.
7. **Optional lead outlet arrangement** permits machine mounting with elimination of conduit box.
8. **Flange and face type brackets** offer alternative methods of machine application.

● Reliance Series C Motors are designed and precision built *to make it absolutely impossible to grease them wrong.* On the vast majority of applications, these factory lubricated motors continue to operate *for years* with no additional lubrication whatsoever. In cases where unusual conditions make occasional attention necessary—or if it is your practice to lubricate at regular intervals—undergreasing or overgreasing make no difference. Write for Bulletin C-118 which tells the whole story—and specify Reliance Series C Motors to forget lubrication worries.

Yes, Reliance will exhibit at
20TH EXPOSITION OF CHEMICAL INDUSTRIES
Grand Central Palace, New York • Week of February 25th

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St. Louis • San Francisco • Seattle • Syracuse • Tampa • Tulsa • Washington, D. C.

RELIANCE A·C D·C MOTORS

(*Continued from page* 334)

Florida	So. Carolina
Georgia	Tennessee
Idaho	Texas
Louisiana	Utah
Montana	Washington
Mississippi	Wyoming

$8,000,000,000 CONSTRUCTION VOLUME NEEDED BY INDUSTRY

Construction activity sufficient to produce an annual volume of at least $8,000,000,000 in 1946, will be required to meet the most urgent demands for new construction and to rehabilitate the industry for its full contribution to development of a high-level economy, the American Institute of Architects declares.

That volume would represent about one half of the capacity of the industry, as established under the war program, and about twice the volume expected for 1945, the Institute stated. It would require construction operations at a rate of from $10,000,000,000 to $12,000,000,000 by the end of the year for attainment, and a substantial expansion in the production of many vital building materials would be needed.

The value of materials needed is estimated at about $4,500,000,000, based on 1940 prices. Principal materials required include brick, concrete, stone, steel, lumber, roofing, heating and plumbing equipment, electrical appliances and builders' hardware.

Building construction, including housing, should account for more than one half of that volume, the Institute estimates, with highways and streets ranking second, and public works (other than public buildings) and utilities, third.

States with annual totals of more than a half $1,000,000,000 for the year, would include New York, Pennsylvania, Illinois, Ohio and California. States with totals of more than $100,000,000 would be Massachusetts, Connecticut, New Jersey, Michigan, Indiana, Wisconsin, Minnesota, Iowa, Missouri, Maryland, Oklahoma, Texas and Washington.

LOW COST GAGING HEADS FOR AIR GAGING SYSTEMS

New class of gaging heads, .240" to 2.510" diameter, identified as Class B, for use with Metricator air gaging systems, is announced by Federal Products Corp., Providence, R. I. Principal difference from the regular gaging head furnished for use with the Federical-Metricator Air gaging system, is that they are not chrome plated and lapped. They are hardened steel, fine ground and have the same high degree of measuring accuracy as the higher priced gaging heads. They are said to provide the same accuracy as the higher priced gaging heads because of the fact that when gaging by air it is not necessary that the head or plug fit the gaged hole precisely as ordinary conventional plugs must. The diameter of the plug acts primarily as a guide for centering it in the hold. They are recommended for shops having short production runs or frequent changeovers where the higher priced gaging heads would prove too costly for the requirements.

NEW HEAT-TREATABLE STAINLESS STEEL OF 18-8 TYPE

Carnegie-Illinois Steel Corporation, United States Steel Corporation subsidiary, announces the release from war restrictions of Stainless "W"*, a new heat-treatable stainless steel of the 18-8 type which makes available the high strength and corrosion resistance of 18-8 in all wrought and cast forms, regardless of size or shape. In this new steel, developed and now made public for the first time, the basic composition is so balanced as to insure, without the necessity of cold working, the approximate completion of the austenite-to-ferrite (martensite) transformation and the subsequent process of precipitation of hardening.

In the annealed condition Stainless "W" ordinarily has a hardness of 22/28 Rc, a tensile strength of 120,000/150,000 psi. and a yield strength of 75,000/115,000 psi. By proper heat treatment the hardness can be raised to 39/47 Rc, the tensile strength to 195,000/225,000 psi. with a yield strength of 180,000/210,000 psi.

Strongly Magnetic

This new steel can be processed successfully in standard equipment and no difficulty will be experienced with warping or dimensional changes in the course of heat treating operations. It is readily fabricated by spot welding and high joint efficiencies can be secured by metallic arc, atomic hydrogen and heli-arc welding operations, particularly when solution annealing followed by aging is employed as a post-welding treatment. Machinability, according to shop tests, is slightly better than that of austenitic 18-8 stainless steel. Unlike most other types of 18-8 stainless steel, Stainless "W" is strongly magnetic.

Preliminary commercial applications of Stainless "W" indicate its usefulness in those cases where hardness plus corrosion resistance is essential, as in cams and rollers in food handling and bottling equipment, bearings, and parts for valves subjected to service in the oil, chemical and food industries. Other applications involving high strength alone, or in combination with hardness and corrosion resistance, can also be filled successfully with Stainless "W", which is unique in that it can be hardened uniformly throughout unusually heavy sections without difficulties normally attendent upon quenching and surface hardening.

Stainless "W" can be rolled into billets, bars, sheets or shapes, drawn into wire or pierced for tubing, or it may be forged as desired into any shape or size, the finished product being amenable to heat treatment to develop the desired hardness in addition to corrosion resistance superior to that of the heat-treatable straight chromium steels and approximately the same as that of 18-8 stainless steels in most corrosive media.

FOR UTILITY

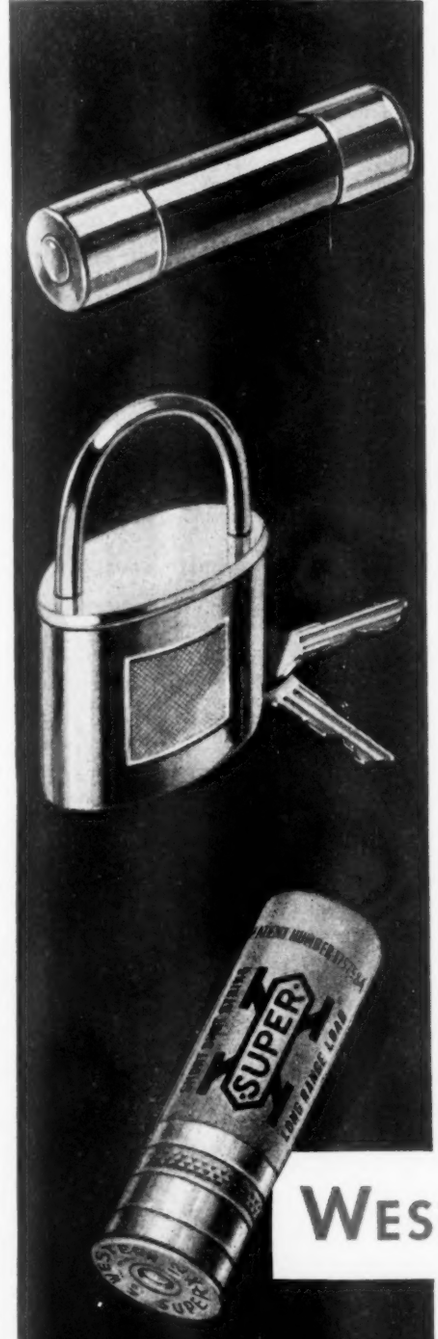
FOR BEAUTY

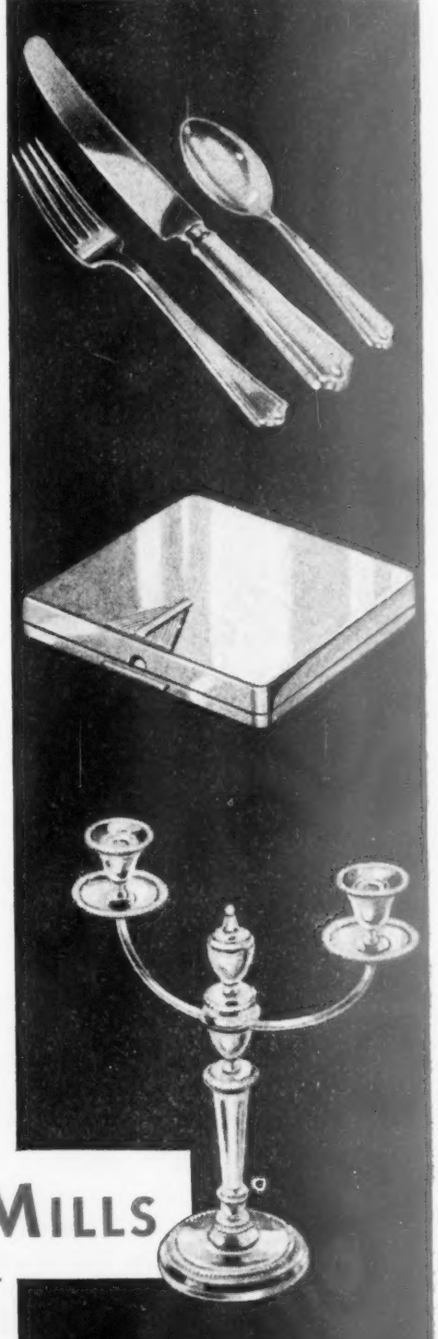
Depend on "Tailor-made" ALLOYS to fit your most Exacting Needs

After thousands of years of expanding service and lasting ornament, brass and other copper-base alloys still are among man's most versatile materials. New ways to use them are being found constantly.

If you are planning some of the utterly new products or redesigning long-absent things that consumers await eagerly, perhaps brass can make them serve better or appear more inviting. We can supply you with brass or other copper-base alloys exactly as you specify—sheets, rolls, strips, coils or stampings . . . in temper, dimensions, ductility or rigidity to suit your precise requirements.

Western alloys are used extensively in manufacturing motor cars, aircraft, railroads and electronic equipment, watches, clocks, refrigerators, electrical appliances, business machines, sporting goods, household equipment and many other products.





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WESTERN BRASS MILLS

WESTERN BRASS MILLS

DIVISION OF OLIN INDUSTRIES, INC.

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Quality speaks for itself!

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Behind this self-evident quality are 73 years of specialized production experience in the manufacture of the finest threaded products.

Let this experience help you solve problems involving the design, assembly or manufacture of any products requiring fastenings.

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- Pipe Plugs
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Complete line includes:

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INVENTORY CONTROLS AMENDED ON WORK STOPPAGES

Inventory controls which granted a 30-day period to permit plants in which work stoppages had occurred to postpone or cancel material orders, have been amended by the Civilian Production Administration.

Under the amendment to Direction 6 of Priorities Regulation 32, continued receipts of materials are permitted beyond the 30-day period wherever necessary to bring the resulting inventory up to the minimum needed for the first 45 days after resumption of production. An exception to this is provided, however, in the case of the very scarce materials on List 1 of P.R. 32, in which case the shorter inventory periods provided in List 1 apply.

Under an earlier amendment, provision was made for inventory adjustments by plants which had already had a work stoppage in effect for nearly thirty days. The new amendment further provides for future work stoppages as follows:

By the 15th day of each month (starting January 15, 1946) as long as the work stoppage continuous, the plant must postpone or cancel all such orders for delivery in the following calendar month.

In the case of work stoppages occurring on and after December 6, 1945, which are still in effect, the plant must, by the 30th day of the work stoppage, postpone or cancel all such orders for delivery in the current month. Also, by the 30th day of the work stoppage or the 15th day of the current month, whichever is later, and by the 15th day of each month thereafter as long as the work stoppage continues, the plant must postpone or cancel all such orders for delivery in the following calendar month.

* * *

REPORT WORLD TIN SHORTAGE CONSERVATION MANDATORY

Warning that a continuing shortage of tin threatens extensively serious effects in the United States, which consumes 40 per cent of the world supply and produces none, was sounded at the 1946 Annual Meeting of the Society of Automotive Engineers in Book-Cadillac Hotel here today.

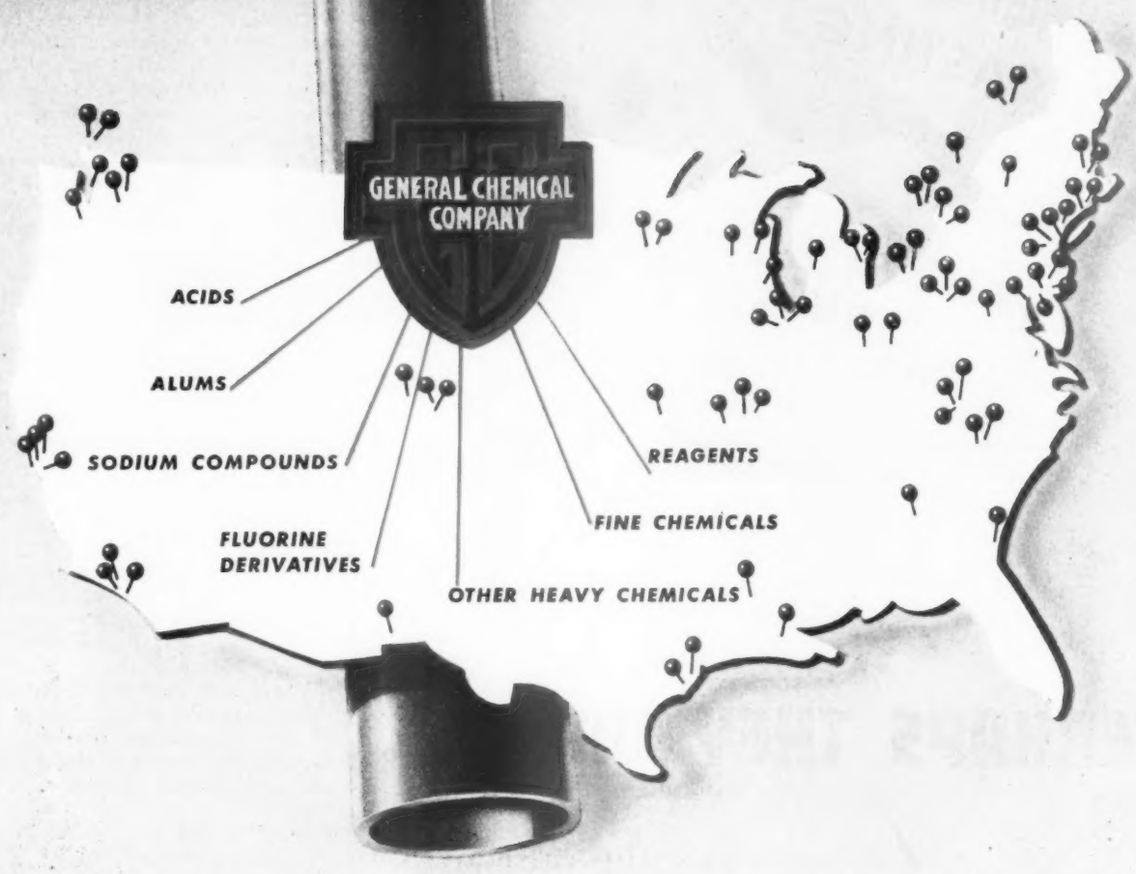
C. E. Heusner and E. T. Johnson, of Chrysler Corp., Detroit, outlined methods, many of them developed by the SAE War Engineering Board, whereby reduction of tin consumption could extend the supply. They indicated that there is, as yet, no really adequate substitute for this commodity, one of the rarest of base metals.

One Year's Supply

Bulk of the world's tin, they explained at the Materials Session, come from the troubled areas of Burma, Siam, the Malay States, and the Dutch East Indies, with Bolivia, yielding 17 per cent of the world's supply, the only large producer of the Western Hemisphere. Current

(*Continued on page* 340)

Supply Line for American Industry...



Here is the supply line of Basic Chemicals for American Industry. North, South, East or West . . . wherever the needs are greatest . . . there, too, are the heaviest concentrations of General Chemical *plants, warehouses,* and *technical service offices*—equipped and prepared to meet the chemical demands of the day.

For almost half a century, this supply line has grown ever stronger. It spans the continent . . . reaches out to the most remote locations . . . always maintaining the full flow of a broad and varied range of chemicals so necessary to peak production.

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Wear and abrasion-resistant

AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION
230 Park Ave., New York 17, N. Y.

4404

(*Continued from page* 338)

total stock of tin in the United States, which has been prospected in vain, was estimated at 95,000 tons, or slightly better than one year's supply at present restricted rates of consumption.

Extension of the supply appears largely to be a matter of conservation, especially economical use, it was reported. Consumption per motor vehicle was said to have been reduced to two pounds, or less, from four pounds in 1940. Recommendations for additional savings were listed as: redesigning parts to eliminate tin, improvement of processing to minimize the demand, and development of domestically-produced alternate materials. Obstacles were classified as metallurgical, involving difficulties in finding suitable alternates; economic, resulting from increased costs; and psychological, representing the natural human resistance to change.

Tin savings are being promoted, it was said, by substituting electro-plating for dipping in tin can manufacture, and by larger use of secondary tin, recovered from tin can salvage operations, in solder, babbitt, and bronze. Conservation was said also to be helped by decreasing the tin content of solder, one of the greater uses. This content was estimated to have declined to 29 per cent of tin in 1943 from 38 per cent of tin in 1939.

INAUGURATE COAST TO COAST AIR FREIGHT SERVICE

Industry is studying with interest plans announced by United Air Lines for inauguration of air freight service over its coast-to-coast and Pacific Coast system effective February 1.

United's air freight tariff, filed with the CAB yesterday, shows rates as low as 27 cents a pound on shipments of 3,000 pounds from coast to coast. Typical examples of the new tariffs are: 25 pounds from New York to the Pacific Coast, $8.78; 100 pounds, $33.63; 25 pounds from Chicago to Los Angeles, $6.46, for 100 pounds, $24.35. The tariff is based on minimum shipments of 25 pounds.

According to C. P. Graddick, the company's director of air cargo, charges are graduated according to volume and distance shipped so as to give the lowest possible rates to volume shippers for long distance hauls.

Graddick said United will continue to carry air express on all planes, with the Air Express division of the Railway Express Agency serving as a nationwide pickup and delivery system. Air freight will be designed for the heavy package type of cargo, moving on less frequent schedules, with optional pickup and delivery.

"Our freight tariff is the simplest yet filed with the Civil Aeronautics Board inasmuch as we do not have various rates for various classifications," said the airline official. "This marks a definite break from the traditions of rail, truck and earlier air freight tariffs." He announced, however, that a separate tariff had been filed for the experimental movement of

(*Continued on page* 348)

BELIEVE IT OR NOT . . . IT'S ONE PIECE!

This heavy, curved welding neck looks like several fittings welded together. That would be the easy way to make it, but the particular condition it serves requires a one-piece forging.

Turning out a hollow forging like this—involving a flanged, curved, and upset section—is a tough undertaking. And yet it is typical of the kind of jobs that many people feel we are better qualified to handle than any other forging plant.

Yes, doing things with hot metal that nobody else does—knowing how to control its flow under pressure and impact — has been our specialty here for a good many years.

It is the "know-how" acquired in these special undertakings that explains why we are able to make WeldELLS and other Taylor Forge welding fittings, the fittings that have "everything" . . . why you find in WeldELLS extra metal properly distributed where service stresses are greatest . . . why WeldELLS have tangents . . . why all dimensions are so extremely accurate.

Just check the list of features, opposite, and we believe you will agree that WeldELLS indeed have everything conducive to sound engineering and utmost economy in every pipe welding job.

No other fittings for pipe welding combine these features found in WeldELLS:

- **Seamless** — greater strength and uniformity.
- **Tangents**—keep weld away from zone of highest stress—simplify lining up.
- **Precision quarter-marked ends**—simplify layout and help insure accuracy.
- **Selective reinforcement** — provides uniform strength.
- **Permanent and complete identification marking**—saves time and eliminates errors in shop and field.
- **Wall thickness never less than specification minimum**—assures full strength and long life.
- **Machine tool beveled ends**—provides best welding surface and accurate bevel and land.
- **The most complete line of Welding Fittings and Forged Steel Flanges in the World** — insures complete service and undivided responsibility.

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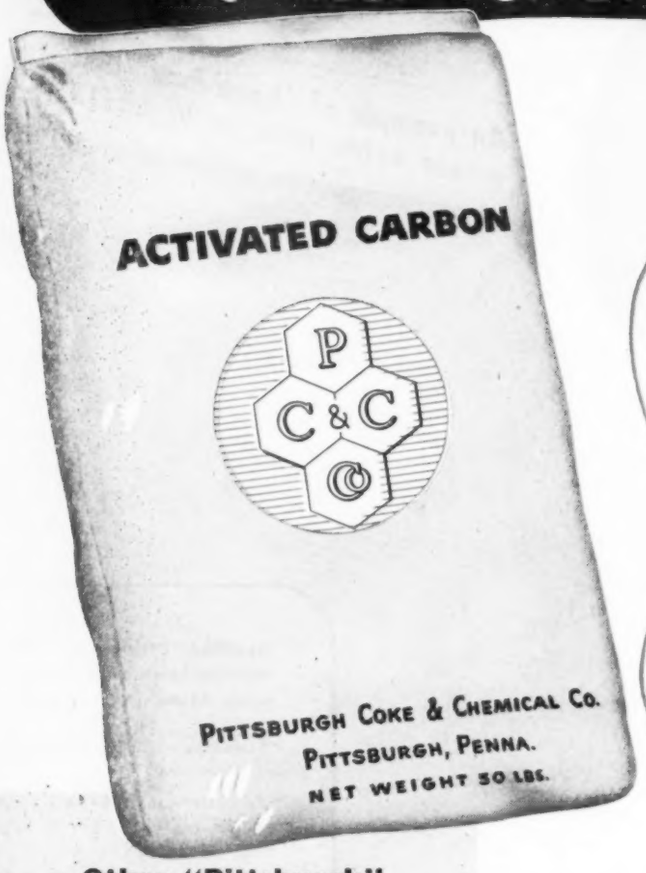
The most Versatile Adsorbent...



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in Gas or Liquid Phase

More adaptable adsorptive qualities and physical characteristics make *Pittsburgh* Activated Carbon the most versatile adsorbent known. New uses are being added constantly to the already imposing list of dividend paying industrial applications.

Chemically stable, susceptible to controlled variety of form and size and readily regenerated, Activated Carbon offers present and potential opportunity for solving problems of adsorption that were previously impossible.

Pittsburgh Coke & Chemical Company is one of the leading manufacturers of Activated Carbon and was the largest single supplier of this adsorbent for the Chemical Warfare Service. Now concentrating on the development of Activated Carbon for the many commercial uses in both gas and liquid phases, the experience of our technical staff is at your service.

Quantity supply is immediately available. Send us your inquiries for quotation.

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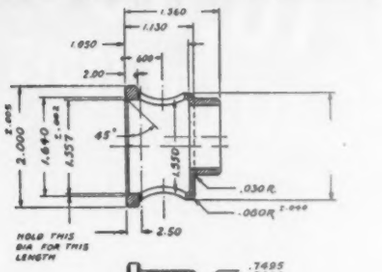
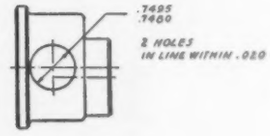
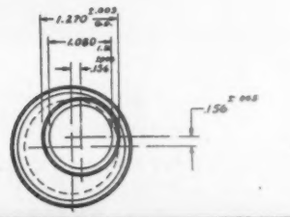
Scovill NON-FERROUS FORGINGS







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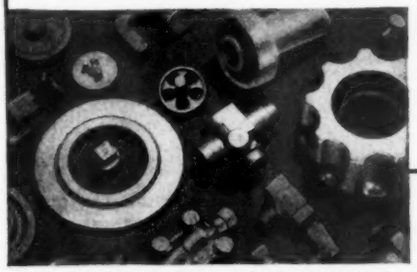
This is a brass part for an airplane engine oil strainer — *forged and machined by Scovill.* An interesting job — but tolerances aren't too tough. Notice that the cavity in the large end is held to ±.002; the center of the hole through the bottom boss, to ±.005 off the center line of the part proper; and the outside of the boss, to ±.003.

If your metal parts present more difficult problems than that, why not unload part of your headache on us. Because we've solved such a wide variety of nonferrous forging problems, there's a good chance that we can be of real assistance to you in suggesting design improvements or manufacturing economies, or both.



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Give us a chance to prove to you that you can save time, trouble and money by making us *your* METAL-PART*ner*. Fill in the coupon below and mail it today.

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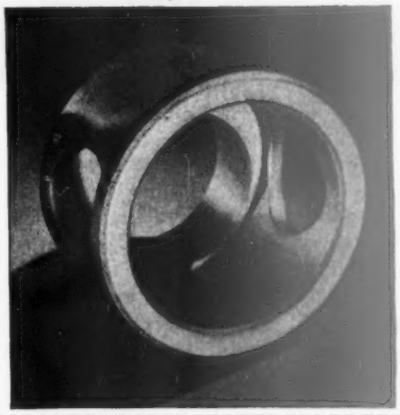

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C. P. A. Priorities Assistance

Five Out of Six Have Received Help in Speeding Reconversion

More than 9,500 of the 12,000 individuals and companies seeking assistance from the Civilian Production Administration and its predecessor agency, the War Production Board, in breaking industrial bottlenecks, have received help in one form or another, CPA reports in its first recapitulation on priorities aid.

This means that almost five out of six or nearly 80 per cent of those seeking assistance under the emergency rating system provided for by CPA's Priorities Regulation 28, have received some kind of help in the job of speeding reconversion and spreading employment. These figures cover the period from August 21 through November 9 of last year.

When PR-28 was issued, WPB and later CPA officials made it clear that CC ratings would be used very sparingly, that applicants for priorities assistance would have to meet very rigid criteria and that only real bottlenecks which were interfering with production at a minimum economic rate would be considered.

As a result, during the August-to-November period, only 3,474 ratings were issued. Some 6,200 cases seeking priorities have come to Civilian Production Administration field office or to the Washington office and it has been possible to steer them to suppliers who were able to help them, often with usable substitutes, without any CC rating having been granted.

Each of the 12,000 cases asking for some kind of help, presented individual problems and Civilian Production Administration files are filled with instances where small businesses, as well as large industries, have been aided, either in reconverting to peacetime production or in starting new production.

Outlining its other activities in this segment of its reconversion work, CPA pointed out that there is also the applicant who needs some material which is still in such short supply that it is a problem to an entire industry. The Civilian Production Administration cannot grant rating assistance to one individual or firm at the expense of others, unless those others have been guilty of premptive buying. Civilian Production Administration officials explained in addition that they will not grant rating assistance to enable a manufacturer to beat a price, to beat production lead times, or to permit pre-emptive buying.

To cite some examples of the many firms, factories and individuals which CPA has aided: A company in New York State, making agricultural machinery, needed some galvanized sheet steel immediately in order to have some of its products ready for the 1946 season. It was granted a rating and its products will be ready for the farmers by next summer.

A Minneapolis concern making farm combines, desired some "zinc grip" sheet steel. In this case the Civilian Production Administration's Steel Division was able to put the company in touch with a supplier who could take care of its needs by supplying an adequate substitute. Therefore no rating needed to be issued.

A widely known manufacturer of domestic heating equipment in Maryland was granted a rating for a sufficient number of fractional horsepower motors to enable him to reconvert his plant from 100 per cent war production to a minimum economic rate of production of oil burners for home use.

A "CC" rating was granted an Illinois manufacturer enabling him to get necessary heating units for his factory. Another helped a new manufacturer to get 8,000 feet of gypsum board with which to complete his factory.

Numerous veterans, desiring to start a new business or to re-enter activities in which they were engaged before the war, have been aided as provided for in Priorities Regulation 28 and in conformity with the expressed intent of Congress. These aids have included ratings for a $450 speed camera to enable a veteran to engage in commercial photography . . . sewing machines for one wishing to manufacture seat covers . . . 1,200 dozen diapers for a new diaper wash service . . . and $11,000 worth of equipment for a veteran entering the bottling business.

Larger companies, some employing thousands, have also been helped by CPA in their efforts to reconvert or to replace vital equipment worn out in war work. Examples in this field are: the Corn Products Refining Company of New York, which needed and was given a rating to buy a $100,000 turbo generator; the E. I. duPont de Nemours Company, Wilmington, was given a rating for about $17,000 worth of equipment to be used in the manufacture of nylon yarn; seven presses to the Electrolux Corporation of Greenwich, Conn., for the manufacture of vacuum cleaners.

It was also explained by Civilian Production Administration that where any application is denied there is always a definite reason. Many veterans, and others, come to the Civilian Production Administration asking for priorities aid in getting textiles. They intend to follow the practice common in the trade, of delivering the materials to others who will cut it up and make it into complete garments. It is Civilian Production Administration's policy to grant ratings only to applicants who own and operate their own fabricating machinery. Therefore no assistance is granted in these cases where materials are sought for others.

Civilian Production Administration officials believe that the need for special priority assistance of this type will diminish as industry generally increases its production and products and materials then become more generally available. It is hoped that within the next few months the use of such assistance will become unnecessary and can safely be discontinued.

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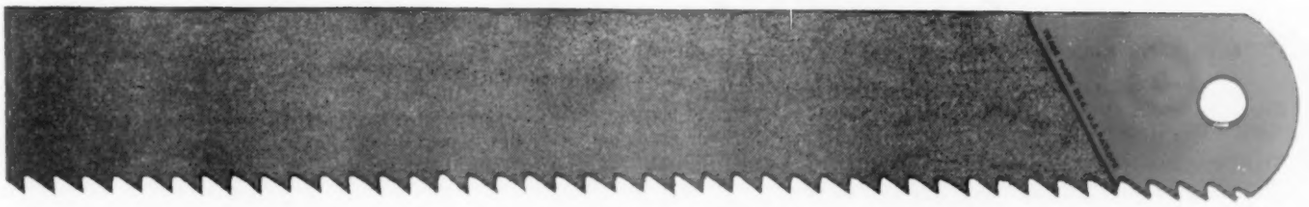

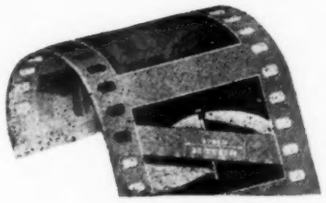

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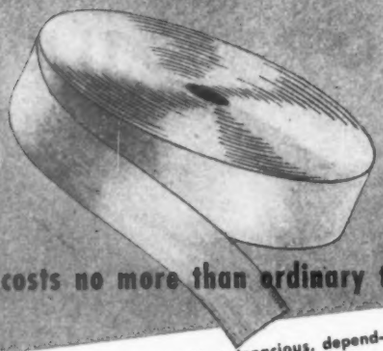

yet it costs no more than ordinary tapes!

Quick-moistening, quick-sticking, tenacious, dependable—these are the qualities that have made Orange Core "America's Most Popular Brand." You can use no better sealing tape to speed up production and make safe arrival of shipments more certain-sure. Try Orange Core as soon as you can . . . you pay nothing extra for its superior performance!

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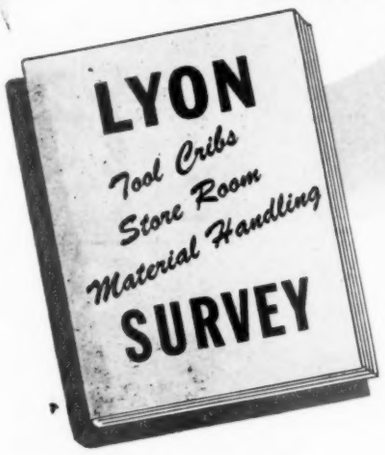
THE ANSWER



A Lyon Survey provides a practical foundation for more efficient operation in stockrooms, in toolrooms, and on production lines. It includes detailed written recommendations for (1) storage layouts that save floor space and provide maximum use of a minimum inventory; (2) Toolroom equipment that gets tools and dies on the job quickly—reduces loss and damage hazards; Selection or design of shop containers of the most efficient size and type for your particular material handling jobs.

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Means Light that is RIGHT

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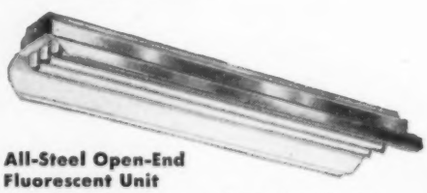
The broad line of Wheeler Reflectors is the backbone of Skilled Lighting. It offers the right fluorescent or incandescent reflector for every area or "spot" in your plant. All are built of heavy gauge metal for long, hard service.

Look in the Wheeler Catalogs for reflectors that show the results of Wheeler's advanced engineering based on 65 years of manufacturing experience. For copies, write to: **Wheeler Reflector Company, 275 Congress St., Boston 10, Mass.** Representatives in principal cities.



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Available for two or three 40-watt, or two 100-watt lamps. Broad wiring channels with accessible, enclosed ballast. Can be mounted from chain or conduit, individually or in continuous runs.

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Maximum lighting efficiency for either indoor or outdoor use. Expertly designed, ruggedly built. 75 to 1500 watts.

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Wheeler Skilled Lighting REFLECTORS

Made by Specialists in Lighting Equipment Since 1881

(*Continued from page* 340)

fruits and vegetables from west coast growing areas to the east at a rate of 15 cents a ton-mile for transcontinental plane-load shipments.

United's air freight service will be inaugurated with use of three daily round trip flights which the company currently is operating from coast to coast with a fleet of twin-engined Douglas DC-3 Cargoliners.

The service will apply to all cities on United's system, either through direct flights of Cargoliners into those cities or through connections of these all-cargo planes with the company's combination passenger-cargo Mainliners.

Through contract arrangements with motor carriers, pickup and delivery service will be provided, at the option of air freight shippers or receivers, in the metropolitan areas of Boston, New York, Newark, Philadelphia, Detroit, Cleveland, Chicago, Denver, Los Angeles, Oakland and San Francisco. Such service will be extended to other cities. This will be separate from the air express pickup and delivery system provided by Railway Express.

United's air freight tariff is based on airport-to-airport service, with pickup and delivery charges being additional. These will be based on actual trucking costs to United, Graddick said, amounting to 35 cents per 100 pounds, for either pickup or delivery. Any shipper or receiver can use his own facilities to deliver or pickup air freight shipments.

WAR ASSETS CORPORATION NEW DISPOSAL AGENCY

War Assets Corporation, a subsidiary of the Reconstruction Finance Corporation has been designated by the Surplus Property Administrator as the disposal agency for government surplus consumers goods and capital and producers goods, it was announced by the Surplus Property Administration and RFC. This action was effective as of the close of business January 15. At that time War Assets Corporation assumed the disposal functions for which the Office of Surplus Property, RFC, has heretofore been responsible.

Effective as of the close of business January 28, all duties of certifying war veterans as eligible for preference in the purchase of surplus property, assigned to the Smaller War Plants Corporation, were transferred to the War Assets Corporation.

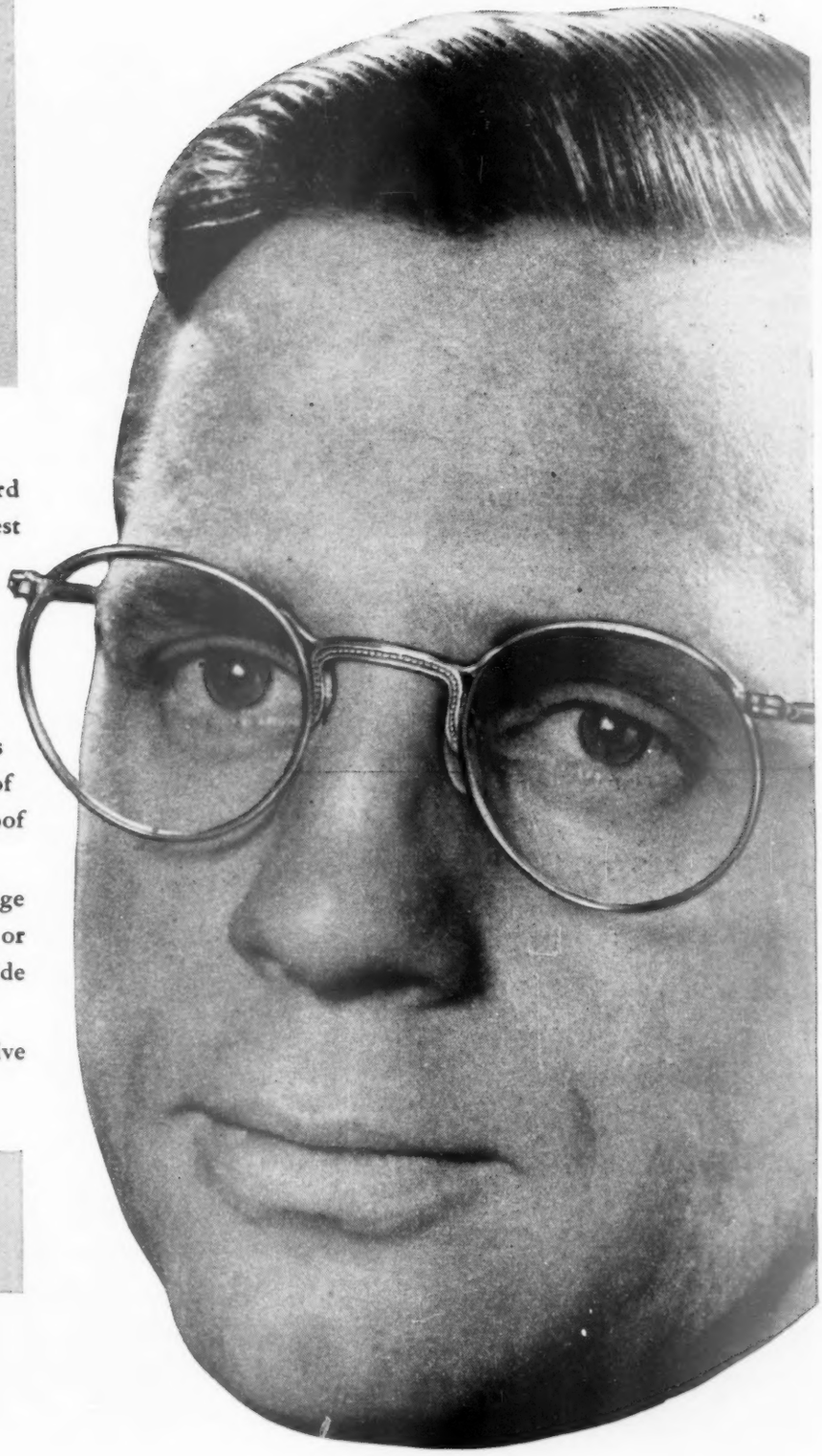
Lieutenant General E. B. Gregory, Army Quartermaster General has taken office as Chairman of the Board of Directors, War Assets Corporation, at the request of the President. He succeeds Sam H. Husbands, Director of RFC who was chosen to fill that office pending the appointment of a permanent chairman.

War Assets Corporation will assume full responsibility including direction of RFC personnel assigned to surplus property disposal activities. Whatever facilities are required by the disposal agency will be made available to it by RFC.

(*Continued on page* 350)

AO Ful-Vue Safety Goggles

Eye Protection plus Comfort and Good Looks



AO Ful-Vue Safety Goggles afford efficient eye-protection with the greatest amount of all-angle visibility, comfort and good appearance. Sturdy, double-braced bridge designed for long life in strenuous service. Shape conforms to orbit of the eye; brings lenses closer for maximum protection; leaves no unprotected areas around bridge of nose. Earpieces have perspiration-proof insulation.

Made in three eye sizes and three bridge sizes, with Super Armorplate Clear or Calobar lenses—with or without side shields.

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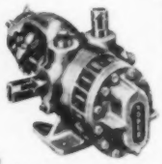
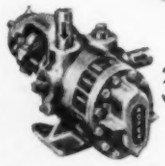
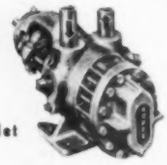
1. Horizontal inlet and discharge.





2. Horizontal inlet, vertical discharge.

3. Vertical inlet, horizontal discharge



4. Vertical inlet and discharge.

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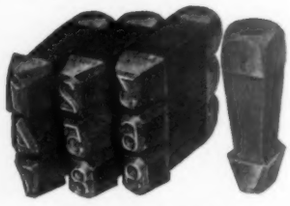

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HELP PREVENT AN ACCIDENT TODAY.

M.E. CUNNINGHAM CO.
SAFETY STEEL STAMPS
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(*Continued from page* 348)

which will continue to work closely with its subsidiary, the War Assets Corporation. In the conduct of disposal activities War Assets Corporation will follow policies established by the Surplus Property Administrator.

It is estimated that during the fiscal year July 1945 through June 1946 Consumers and Capital and Producers goods which cost the government approximately $23,000,000,000 will have been declared surplus.

1 1 1

REPORT OF TEXTILE TEAM SENT TO GERMANY

The reports of the "textile team", sent to Germany by the Office of the Quartermaster General were announced by the War Department at the industry research meeting held in October at the Engineering Societies Building, New York City.

The papers presented by the six field investigators constitute a preliminary report to the textile industry. They cover textile fiber, fabric and finishing aspects of the general survey being made of technical and research developments in the German textile industry by two groups of research investigators now in Germany for this purpose.

One of these groups was sent by the Office of the Quartermaster General under the auspices of the Combined Intelligence Objectives Subcommittee, to which these six representatives were attached and the second, a larger group, with a somewhat broader objective of obtaining technical information relating to every phase of the German textile industry, was sent to Germany by the Textiles Subcommittee of the Technical Industrial Intelligence Committee under the Foreign Economic Administration.

The meeting was sponsored by the 33 textile members of the Advisory Board, Research and Development Branch, Office of the Quartermaster General, in cooperation with the Inter-Society Council for Textile Research.

The meeting opened, Lt. Col. S. J. Kennedy, Chief, Textile Section, Research & Development Branch, Office of the Quartermaster General, who outlined the general background of technical investigations of German textile developments. The papers presented were as follows:

Organization and Research in Germany, Joseph P. Meierhans.

The Zellwolle Lehrspinnerei at Denkendorf, Dr. Earl Heard.

German Methods for Utilizing Unretted Flax and Hemp as a Textile Fiber, John F. Hagen.

Woolen and Worsted Industries in Germany, Werner von Bergen.

An Investigation of the Textile Dyeing and Printing Industry in Germany, Frank S. Richardson.

German Manufacture of Continuous and Staple Fibres and Related Products, Lloyd L. Leach.

Copies of these papers and of the final reports are released by the Office of Publications Board, Department of Commerce.

(*Continued on page* 352)

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FOR NINETY YEARS we have specialized in the manufacture of precision wire cloths, wire screens, and woven wire products for every type of industry.

Our "Perfect" wire cloths and wire screens include a wide variety of weaves, each designed for exacting specifications, precisely woven to insure accuracy of openings, and built for durability plus exact performance.

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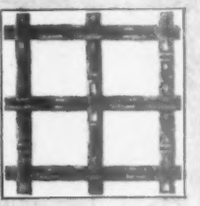
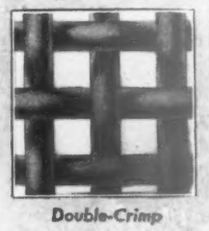
Your specifications and blueprints will be followed exactly as your production engineers have designed them; our engineers will assist you in any unusual problems that may arise.



Arch-Crimp



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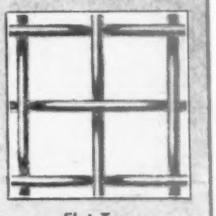
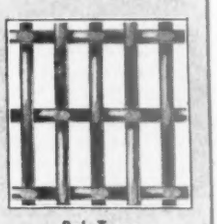
- Nickel

Any special alloys available in rod or wire form.



Flat Top



Rek-Tang

Dutch Weave

The LUDLOW-SAYLOR WIRE COMPANY

620 South Newstead Ave ST. LOUIS 10, MISSOURI

"BAKER *Articulated* FORK TRUCKS

were an invaluable aid in production of aircraft engines"

Says Packard Motor Car Co.

Here's what Packard says about their trucks:

"Baker articulated fork trucks were an invaluable aid to the Packard Motor Car Company in production of aircraft engines for five Allied planes. While adaptable for virtually any transport job in the factory, they were particularly outstanding in their capabilities for loading and unloading cars. "Through use of the Baker trucks it was possible for one man to load 26 motors into a car in the minimum time of one hour. Because of their flexibility, the trucks required less space for movement, and, as a result, permitted full and orderly utilization of available space."

Baker Articulated Fork Trucks have been in service at the Packard Motor Car Company since 1941. Before that, boxed aircraft engines were loaded into railroad cars with conventional fork trucks. These trucks could load the ends of the car, but to complete the carloading, boxes had to be placed on rollers and pushed into place. This obviously slowed up carloading and required the services of several employees.

Because Baker Articulated Fork Trucks require less clearance for spotting loads and can be easily maneuvered in congested areas, one operator quickly loaded the complete car without resorting to hand methods. These same advantages also produced similar savings on other material handling operations in production and storage departments.

If you have a problem of moving material where space is limited, or if you would like to use warehouse space to better advantage, let a Baker Material Handling Engineer show you what this revolutionary new truck can do. Or write us direct.

THE BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2148 West 25th Street • Cleveland, Ohio
In Canada: Railway and Power Engineering Corporation, Limited

EITA *Member: Electric Industrial Truck Association*

Baker INDUSTRIAL TRUCKS

(Continued from page 350)

In presenting these reports, the War Department is merely distributing technical information which has come into its hands from occupied German territory. Use of it must be and is at users own risk insofar as the United States or foreign patent violations are concerned.

ATOMIC BOMB "SECRET" OUT

The United States cannot keep the "secret" of the atomic bomb, because it is already generally known, Dr. C. G. Suits, vice president of the General Electric Company and director of its Research Laboratory declared before America's Town Meeting of the Air, St. Paul.

"Lean forward and I will tell you the 'secret' of the atomic bomb," said Dr. Suits. "Uranium undergoes a process called fission, splitting into two nearly equal parts, with the release of 200 million electron volts of energy. Aeutrons are also released which split other uranium atoms, leading to a chain reaction. The German scientist, Dr. Lise Meitner, probably first appreciated this secret. It was published in 1939 and is known to all the world, but only the United States has the factories for producing atomic bombs, and most important, the technical and engineering know-how. Other nations will develop this know-how in about five years.

"We have a period of grace of about five years in which to solve this problem of how to live at peace with our neighbor nations in a world of atomic bombs. If we fail, civilization fails. If we succeed, our children will climb to new heights on the scale of civilization."

Explaining "what is good" about power from the atom, Dr. Suits pointed out that "science has broken into a vast, almost unlimited storehouse of energy, and we are presented with opportunities for benefiting mankind to a degree hitherto unimaginable. It has been the use of energy in its various forms—mechanical, chemical, hydraulic, thermal and electrical—which has raised mankind from primitive levels to the high standard of living we already enjoy, and now we see before us a new, marvelously concentrated form of energy with which we may climb to heights we can only dimly foresee. It is indeed a new world which has been opened for exploration and development, but that pioneering will be arduous and beset by obstacles, requiring the co-operative efforts of the best scientific brains not of one nation alone but of all the world."

Each day, Dr. Suits said, the electric energy used in the United States adds up to nearly a billion kilowatt-hours. "The nucleus of the atom," he declared, "contains ten billion kilowatt-hours for each pound of matter! It is true that the nucleus of uranium 235 of plutonium, as used in bombs, yields a mere ten million kilowatt-hours per pound today, but some day it will yield more! Here is a Colossus who can work for mankind on a scale that will make the industrial revolution appear a minor milestone on the road of civilization. Here is more power for the head of man."

CIRCLE Ⓑ from billet to bolt...and that means uniform, controlled quality

From billet to finished product the manufacture of all circle Ⓑ fasteners is controlled in one plant—the largest independent in the country. For this reason you can depend on the hundred thousandth bolt or nut leaving the machine to be as accurate in size shape and thread as the first.

THE UNIFORM QUALITY OF ALL CIRCLE Ⓑ PRODUCTS BEGINS IN OUR OWN ROLLING MILLS.

Ⓑ BUFFALO BOLT COMPANY

NORTH TONAWANDA, NEW YORK

Government-Owned

SURPLUS STEEL

Reasonably priced for substitute uses

AVAILABLE NOW

Terms to fit your production budget

Over 50,000 tons of hot rolled and cold finished carbon and alloy steel bars in rounds, squares, flats and hexagons, priced downward—for substitute uses.

Budget priced, these 50,000 tons consist of 25,000 tons of carbon and 25,000 tons of alloy H.R. & C.F. bars, in sizes to meet your immediate requirements.

In addition, there are 60,000 tons of carbon and alloy billets, blooms and slabs. These semi-finished products are also priced for quick delivery in meeting the demands for substitute uses. If you qualify for credit, terms may be arranged. For detailed specifications, grades, sizes, deliveries and F.O.B. prices, simply write, wire or phone the nearest RFC Agency listed below.

WHAT ARE YOUR REQUIREMENTS? — CHECK THIS LIST

1. Carbon and Alloy Billets, Blooms, Slabs, Skelp, Rods, etc. . . . . ☐
2. Reinforcing Bars . . . . . ☐
3. Structural Steel Shapes . . . . . ☐
4. H. R. & C. R. Sheets, Strip Steel, Carbon and Alloy . . . . . ☐
5. Plates—Tin Plate, Terne Plate, Black Plate . . . . . ☐
6. Wire and Wire Products, Carbon and Alloy, Wire Rope, Reinforcing Wire Mesh . . . . . ☐
7. Stainless Steel Sheets, Strips, Standard Types . . . . . ☐
8. Iron and Steel Pipe, and Tubing—Valves and Fittings . . . . . ☐
9. Mechanical Tubing, Carbon and Alloy . . . . . ☐

Name .....

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VETERANS: **To help you in purchasing surplus property from the RFC, a veterans' unit has been established in each of our Disposing Agencies.**

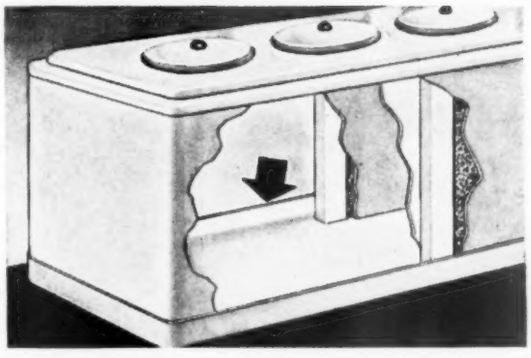
RECONSTRUCTION FINANCE CORPORATION

A DISPOSAL AGENCY DESIGNATED BY THE SURPLUS PROPERTY ADMINISTRATION

Agencies located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cleveland • Dallas • Denver Detroit • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

157-2

Meet this man



FOR INSTANCE, in making large sectional refrigerating units, wood frames are filled with packets of fiber glass insulation. This insulation must be protected from moisture vapor, first by an asphalt solution treatment, then by sheets of waterproof laminated paper joined tightly where they meet the framework.

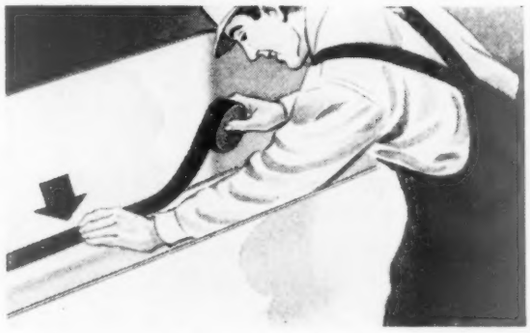
HERE'S WHAT HE DOES:

He is a Bauer & Black Technical Consultant. While these men do not have the solutions to all of Industry's problems at their finger tips, their wide experience in their own field does mean that any Production Manager or Plant Superintendent *may* learn more effective, less costly ways of using tape by calling one in. *(Without obligation, of course!)*

We suggest that you write TODAY to Dept. 22 and tell us when you will find it convenient to have him call.

NOTE: On your request we will gladly send you regularly our monthly AUTOMOTIVE NEWS LETTER containing interesting and up-to-the-minute facts about the industry. No obligation of any kind.

Liquid adhesives could do the job—after a fashion. But spreading them is messy, inconvenient, slow. So the manufacturer called in the man we urge you to meet if you use *any* industrial tape: a Bauer & Black Technical Consultant.



CONCLUSION: The result was application of a ⅞-inch Bauer & Black Industrial Tape which does the perfect job—neatly, conveniently, quicker, with much easier handling, and at an appreciably lower cost in dollars.

BAUER & BLACK

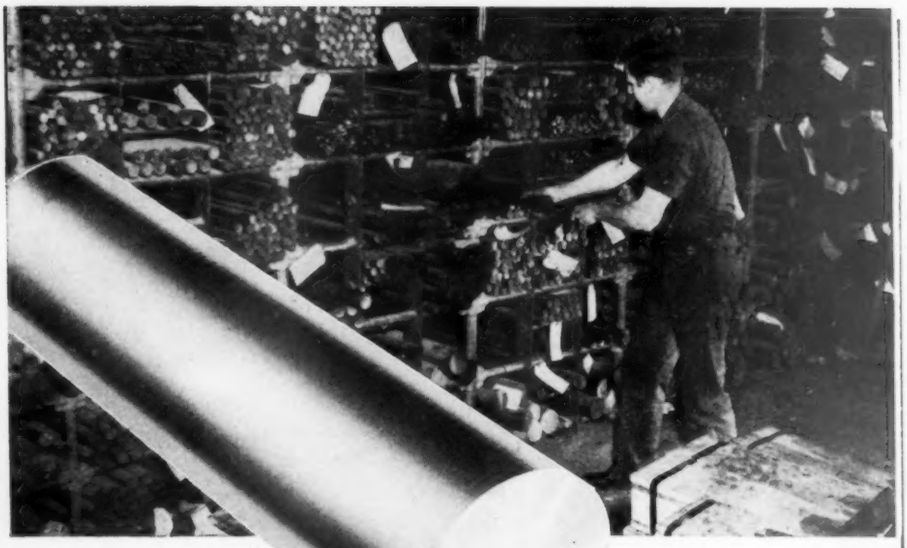
DIVISION OF THE KENDALL COMPANY • 2500 SOUTH DEARBORN STREET • CHICAGO 16

PRODUCTION SHORT CUTS TO REDUCE COSTS

Industrial Tape

PRESSURE SENSITIVE ADHESIVE

RESEARCH TO SPEED AND IMPROVE METHODS



Aluminum Bronze Rods–extruded by Ampco

...for higher strength...good surface finish...compact structure

. . . result in a better product for your customer

Two grades of Ampco Metal and two grades of Ampcoloy bronze are produced in extruded form at Ampco Metal, Inc.

Extruded Ampco products are available from a modern extrusion mill, with the largest extrusion press in the Middle West and one of the few in the world devoted exclusively to the extrusion of aluminum bronze.

Barstock, heavy walled tubing, and various shapes are provided to meet your needs—from a mill that contains all the modern equipment required to handle this type of work.

The quality of Ampco extruded stock reflects care and consideration of detail in each step of the process—controlled melting and alloying, exact billet casting and billet heating technique, plus careful inspection of the finished product.

AMPCO Metal
The Metal without an Equal

Write for **Bulletin 64A**
It gives you valuable information about Ampco extruded products.

Ampco Metal, Inc.
Department P-2 Milwaukee 4, Wisconsin
Ampco Field Offices in Principal Cities

Specialists in engineering production — finishing of copper-base alloy parts.

A-23

How to Read a Price Index

(*Continued from page* 102)

counts. A knowledge of the averages may be very useful, but it does not answer the questions in respect to any one component of the average. It may be necessary to maintain special charts for individual items.

Similarly, the price index is a background for judgment. It is a historical record, not a forecasting device. Trends may be projected, but they may also be approaching a turning point. Particularly dangerous is a snap judgment based on only the last two or three index figures of a series. In the examples shown, the Fisher index reports an increase of 0.06 for the last week of December, while the McGill index reports a decrease of 0.2. The mathematical discrepancy is negligible, but the difference in direction may lead to widely divergent conclusions. Forecasting is not a matter of formula, but a matter of judgment. There is no better basis for judgment than a sound price index, but don't expect it to do the work for you.

BUTYL RUBBER AVAILABLE FOR TIRES

The use of butyl, the special purpose synthetic rubber credited with retaining air far better than natural rubber, will be permitted for the manufacture of inner tubes for all passenger car tires after January 1, 1946, W. James Sears, Director of the Rubber Division of the Civilian Production Administration, announces.

After the first of the year, Mr. Sears said, not only all passenger car tubes, but inner tubes for all small truck and tractor-implement tires may also be made from butyl. Until January 1, 1946, the use of butyl in tube manufacture will continue to be restricted to inner tubes for military vehicles, certain large-size truck, bus and tractor-implement tires and passenger tires 6.50 and larger.

"The air-retaining quality of butyl rubber permits uniform tire pressure, which is one of the most important factors in obtaining long service from synthetic tires," Mr. Sears said. "Butyl has proved of infinite value in large truck and bus tubes for the past two years."

The authorization for the increased use of butyl for tube manufacture was granted through the issuance of Amendment 1 to Appendix II of Rubber Order R-1, which is the basic rubber control order. Appendix II was published in amended form on November 15, 1945.

The restriction against use of butyl in the manufacture of bicycle tire tubes will remain in effect after January 1, 1946.

Bemis "Three Way Service" Gives You

1. CLOSING MACHINERY
2. PACKAGING HELP 3. BAGS

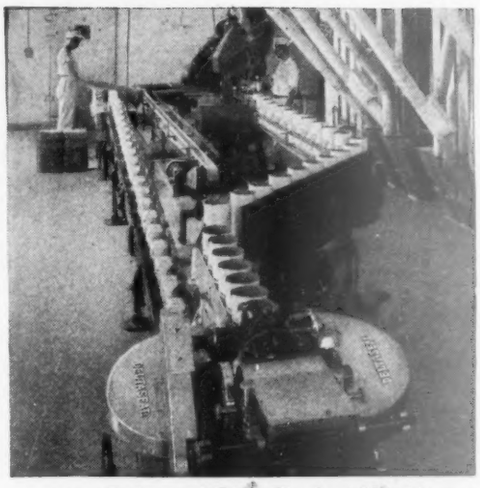
When You Use the Bemis Deltaseal System of Packaging

☆ ☆ ☆

With the Bemis Deltaseal System of Packaging you get *every element* of a complete three-way packaging service from *one* company.

For manufacturers whose products are sold in powdered or granular form, it has already proved the way to increased sales and lower packaging costs.

Look at these three basic packaging functions which make it easier for you to handle and sell your product.



1. **Deltaseal Bag Closing Machinery** —Designed by Bemis packaging specialists.

2. **Packaging help**—Bemis specialists assist you by making timely suggestions for new efficiency on your packaging lines.

3. **Bags**—The Bemis Deltaseal Bag, colorfully printed with your brand, gives you the Deltaseal feature, the "easy pour" spout that has won enthusiastic consumer acceptance and is equally popular with your trade.

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Deltaseal*
SYSTEM OF PACKAGING

BEMIS BRO. BAG CO.
Minneapolis, Minnesota

OFFICES: Baltimore • Boston • Brooklyn • Buffalo • Charlotte
Chicago • Denver • Detroit • East Pepperell • Houston
Indianapolis • Kansas City • Los Angeles • Louisville
Memphis • Mobile • New Orleans • New York City
Norfolk • Oklahoma City • Omaha • Orlando • Peoria
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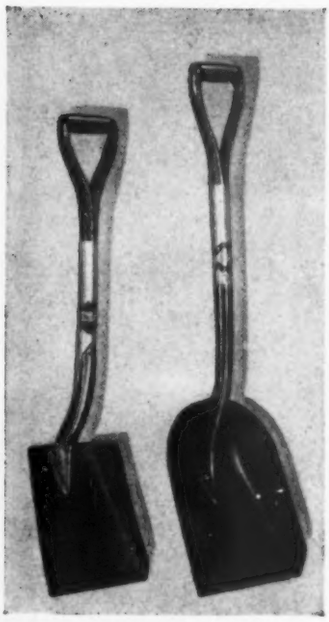
BETTER BAGS SINCE 1858

* Reg. U. S. Pat. Off.

CALL YOUR BEMIS REPRESENTATIVE TODAY. THERE IS NO OBLIGATION.



All Blade Finishes now Black except Molders' Shovels and Grain Scoops which may be furnished with Polished Face and Brushed Back.

A "Good Buy" in SHOVELS!

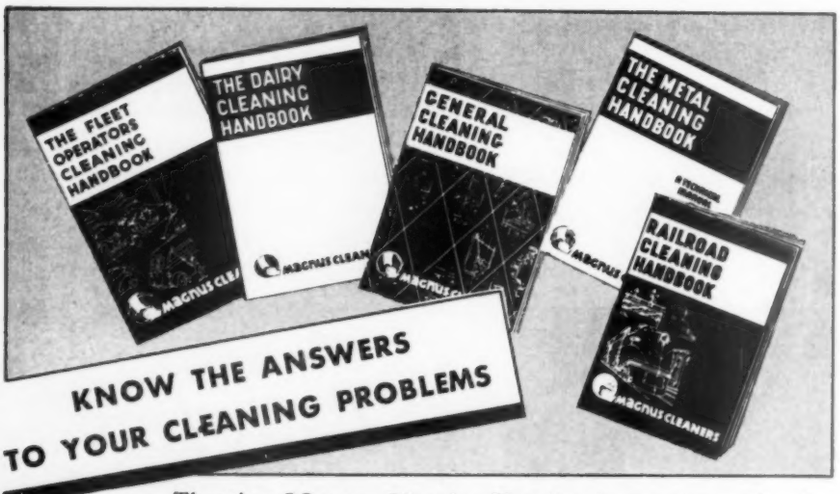
That's what you get when you specify . . .

INGERSOLL *Shovels*

One reason they are such a "good buy" is that their blades are made of TEM-CROSS Steel . . . guaranteed *not* to split at the blade edges. You get this extra value and better service without paying a premium for it.

So whenever you order Shovels, be sure to specify "Ingersoll"—"A Borg-Warner Product."

INGERSOLL STEEL DIVISION
Borg-Warner Corporation
NEW CASTLE, INDIANA
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.


THE FLEET OPERATORS CLEANING HANDBOOK
THE DAIRY CLEANING HANDBOOK
GENERAL CLEANING HANDBOOK
THE METAL CLEANING HANDBOOK
RAILROAD CLEANING HANDBOOK
KNOW THE ANSWERS TO YOUR CLEANING PROBLEMS

There's a Magnus Cleaning Handbook covering each of the following industries or buildings:

Automotive	Dairy	Food Processing	Paper Mill
Aviation	Trucks	General Building Cleaning	Petroleum
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Each book is a complete manual telling the "Why" and the "How" of every cleaning operation faced in the field the book covers. One or more of these manuals will help you cut costs, and improve the quality of cleaning, and avoid damage to equipment, painted surfaces, floors, etc., caused by the use of the wrong methods or cleaning materials. Write for as many of each as you can use.

MAGNUS MAGNUS CHEMICAL CO. 93 SOUTH AVE., GARWOOD, N. J.
Cleaners • Methods • Machines

Cost Components 1914-1945

(*Continued from page* 114)

in mind, at the same time, the circumstances of all sorts which are peculiar to specific industries.

It is probable that the materials and unit labor cost ratios have tended to advance in the past five or six years. What happens after the transition period will depend on the relative price changes for materials and finished products, the level of output, and the relationship between average hourly earnings and output per man-hour (i. e., unit labor costs). Great price pressures have developed during the war years, but their impact differs from industry to industry. In most areas, materials prices have advanced more than prices for processed goods, but examples of the contrary tendency have also occurred.

The purchasing agent should study each case on its own merits, giving appropriate attention both to the general and specific factors, and tying all of them up to answer questions relating to the likely timing and magnitude of price changes. Changes in the individual cost ratios furnish valuable clues on the existence and nature of particular pressures.

In general, manufactured products may well increase faster in price than raw materials for a year or so, thereby tending to depress the cost ratio for materials, but it is not at all clear as to what will happen to unit labor costs.

* * *

How to Determine the Right Price

(*Continued from page* 132)

The use of an average index of material prices and labor costs is not without disadvantage. In industries having one or only a few manufacturing units, there is a possibility that cost control will not be rigorously practised. In other industries where many units share the total production, the use of an average index results in certain inaccuracies.

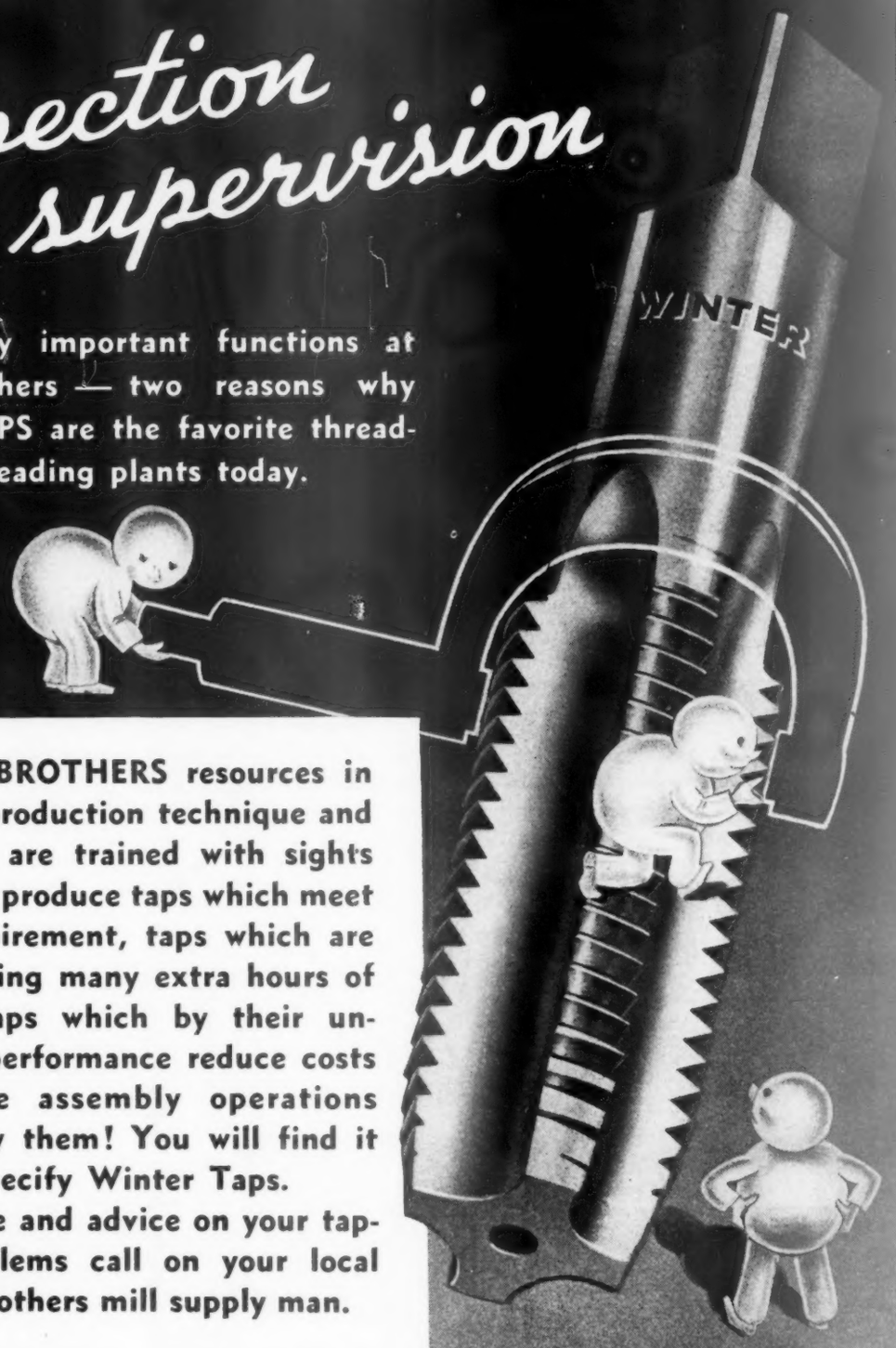
Within practically every index there exist a multitude of highly divergent trends which may not reflect the time costs in the individual contractor's plant.

Over a period of time, many manufacturers have paid higher wage rates and higher prices for the materials they buy without changing the prices of the finished goods they sell. This is accom-

(*Continued on page* 360)

Inspection and supervision

are extremely important functions at Winter Brothers — two reasons why WINTER TAPS are the favorite threading tools in leading plants today.



WINTER BROTHERS resources in research, production technique and laboratory are trained with sights high — to produce taps which meet every requirement, taps which are tough, giving many extra hours of service, taps which by their unmatched performance reduce costs and make assembly operations easier. Try them! You will find it pays to specify Winter Taps.

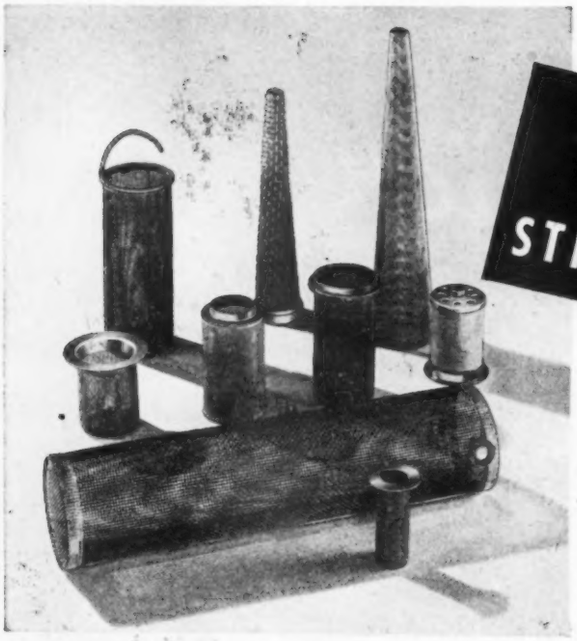
For service and advice on your tapping problems call on your local Winter Brothers mill supply man.

Winter Brothers

COMPANY Wrentham, Massachusetts, U.S.A.

BRANCH STORES SAN FRANCISCO, CALIFORNIA · CHICAGO, ILLINOIS · DETROIT, MICHIGAN

A DIVISION OF THE NATIONAL TWIST DRILL & TOOL CO., ROCHESTER, MICHIGAN



JELLIFF FUEL STRAINERS

OTHER JELLIFF PRODUCTS

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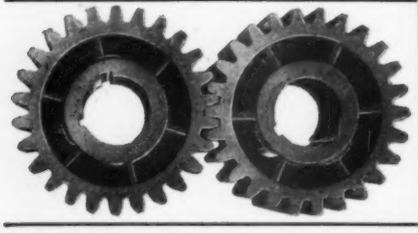
WIRE CLOTH
WIRE FILTERS
RESISTANCE WIRE
LEKTROMESH
DIPPING BASKETS

Jelliff has all the facilities for making fuel strainers. Wire drawing, weaving, and fabricating all in one plant — each step carefully watched by an inspector trained for that particular job. Rigid adherence to specifications and tolerances is guaranteed; AND SHIPPING SCHEDULES ARE MAINTAINED.

The C. O. JELLIFF MFG. CORP.
22 PEQUOT AVENUE · SOUTHPORT, CONN.

SIMONDS GEARS



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.... MADE TO YOUR ORDER

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WORMS · WORM GEARS · RACKS
Cast and Forged Steel, Gray Iron. Bronze, Silent Steel, Rawhide, Bakelite

Distributors of RAMSEY Silent Chain Drives & Couplings

THE SIMONDS GEAR & MFG. CO.
25TH AT LIBERTY
PITTSBURGH 22, PA.

Waterbury
MOLDINGS OF MERIT

This 1946 Emerson Radio strikes a new note in decorative appeal, with its plastic grille compression molded in Lucite by Waterbury Companies. Intricate molding is no problem for Waterbury.

WATERBURY COMPANIES, INC.
FORMERLY WATERBURY BUTTON CO.
BUYER AVE., WATERBURY, CONN.

How to Determine the Right Price

(*Continued from page* 358)

plished typically through the use of existing inventories or work in process, current fixed price contracts for materials, increased efficiency and lower unit overhead costs due to increased production. Hence, a purchaser who buys on a negotiated price adjustment clause may pay loyer prices than one who uses escalator contracts. The use in War Department contracts of provisions for escalation is not authorized except for O.P.A. controlled materials mentioned above.

Incentive and Target Contracts

In special and limited fields of buying, various types of target or incentive contracts have been satisfactory. A typical target price contract as used by the Navy Department establishes an estimated dollar value cost and profit with a ceiling price. On completion of the contract a careful cost check is made. If the actual cost is less or greater than the estimated cost, it is allowed and an agreed upon percentage of increase or decrease is added to or subtracted from the dollar profit value. The British target price contract differed from the Navy's in that no ceiling is established.

Because of the advantage to the contractor in the opportunity to increase his profit by cost reductions and to be reimbursed up to a point for cost increases, his risk is less than under a fixed price contract; therefore the profit margin at the target price will ordinarily be lower than that allowed for an equal fixed price.

The War Department, in general, has not favored the use of target price contracts as the target price must be well set, particularly not too high. The contractor might endeavor to get his target up as high as possible, because the higher the target price, the more likely he is to share in reducing his cost below the target price point. It is reasoned that if a target price can be well set, a fixed price can be established equally as well. While an incentive type may provide a stimulus for cost reduction, it does not provide as much as the fixed-price contract would. Under the fixed price contract if savings are made, the contractor gets the entire saving. The incentive type contract entails substantial auditing and may delay for many months the final settlement of the contract price.

FOOD HANDLERS find U·S·S Stainless Steel immune to food stains, rust and tarnish, easy to keep clean.

THE REFINING INDUSTRY may choose from a wide variety of U·S·S Stainless Steels to solve many corrosion and oxidation problems.

IN TEXTILE MILLS, U·S·S Stainless Steel provides resistance to corrosion from dyes and cleaning compounds.

LARGE STOCKS OF *Stainless Steel* AVAILABLE FOR IMMEDIATE SHIPMENT...

Call Us!

WE are continuing to build up our warehouse stocks of U·S·S Stainless Steel. Sheets, plates, rounds, bars of all kinds, pipe, tubing, angles and welding electrodes in all standard grades and specifications are available for quick delivery.

OUR ENGINEERS WILL HELP YOU!

War production has taught us hundreds of new ways to use Stainless Steel. This increased knowledge is at your service. Our engineers will gladly assist you in selecting the proper types of U·S·S Stainless Steel for your requirements and will help you with fabricating problems. Free technical bulletins will be sent to you upon request.

PHONE, WRITE OR WIRE our nearest warehouse when you need Stainless Steel. A call to us may help you solve a production problem, may speed reconversion to peacetime operations. Your orders and inquiries will receive courteous attention and immediate action.

UNITED STATES STEEL SUPPLY COMPANY ★ USS STEELS ★ SERVICE

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TWIN CITY	2545 University Ave., St. Paul (4), Minn. NEstor 2821

UNITED STATES STEEL

The Road Ahead

(*Continued from page* 85)

we turn back to our beautiful picture and notice that somehow the landscape has changed. The rosy glow has faded; we see more clearly; our eyes are wide open. When we first looked at it, we were partially blinded. We counted only 56 radio manufacturers, and now we find 160. Only now do we realize that this same thing has happened in thousands of other lines of human endeavor. Only now do we see the word *Competition* hovering over each individual group in the industrial picture. We turn and face the future, and we realize, as never before, that what we need most is *Courage* — that invisible strength which carried Washington on from Valley Forge, carried Eisenhower through the Battle of the Bulge, and carried MacArthur back to the Philippines.

So the salesman I meet today is thinking about the two sides of this picture, and like the purchasing agent, he is trying to pierce that veil known to us as the future, trying to pry from it the answers to his many problems. What those answers will be, only time can tell. But both he and I must learn to like and to get along with each other, for we shall travel the road ahead together. Arrogance and pomposity will have no place in the marketing of tomorrow. The days of the fast-talking, back-slapping types of salesmanship have passed. And the marketing prima donna has gone the way of the dodo bird.

In the past, it seems to me we have acted like children. With our petty sniping, with our childish poetry and prose (no apologies to Elbert Hubbard), we have cost marketing a lot of money. We have thoughtlessly built a barrier between the representatives of sales and the representatives of buying, forgetting our interdependence each upon the other. This barrier must now be broken down and eliminated if we are to meet the demands of the marketing of tomorrow. To do this, those of us in purchasing and those of us in sales must honestly bring out into the open all of our aches and pains, our petty grievances, and our misunderstandings. We must analyze our differences and build a bond of real cooperation, for only by cooperation can we do our respective jobs and maintain progress.

So let us cooperate, not only in our individual relationships, but on a broader scale by meetings and get-togethers where these mutual problems can be talked over. Sales can help purchasing, and purchasing can help sales. Let us not forget that, in the face of rising production costs, we have thoughtlessly felt that labor was the only expense we could influence, while we have been blind to the avoidable wastes and unnecessary cost we have saddled on marketing with our childish bickerings.

As the glow fades from our rosy picture, we find plenty of dark clouds; but behind them are rays of silver light, of hope for better things to come. With heads up, shoulders squared, our two feet planted firmly on the good earth and our eyes front —with courage to work, courage to analyze the facts, and courage to cooperate—we will be able and ready to perform this major task of marketing and distribution in a manner equal to the great demands it places upon us.

ONE OF THESE DAYS

He'll Catch Him!

Yes, Supply will eventually catch up with Demand and we'll be out of the most hectic experience of all time. And we'll certainly welcome the change. For, once again the principal part of our service will be helping our customers to *get* business — by assisting with product designs, making tests, and working out refinements that will better meet competition or increase profits. This is the constructive work we like to do.

Meantime, it is still RUSH with us. If your order seems slow in arriving, believe us we are also worrying about it, and before long you will have it.

THE PECK SPRING CO., 40 WELLS ST., PLAINVILLE, CONN.

Peck SPRINGS & SCREW MACHINE PRODUCTS

INSTITUTE Wipers are Back!

DEMAND THE LABEL THAT GUARANTEES . . . .

Sterilization

Maximum Absorbency

Honest Weight

Integrity

The war brought an unprecedented demand for wiping materials by the Army, Navy and Air Corps. Experiments were tried with paper wipers. They were found wanting. Neither shredded waste, industrial towels nor new materials were acceptable. In short, *no satisfactory substitute could be found for sterilized rags.*

As a result, 66-2/3% of wiping cloths produced by Institute Members was allocated to direct military agencies under terms of Limitation Order L-312. Many industrial plants, unable to get products of Institute Members were forced to use less satisfactory substitutes. The Armed Forces came first!

With revocation of L-312, Institute wipers are again available in any reasonable quantity for industrial use. If you were forced to use less satisfactory substitutes during the war, *now* is the time to "reconvert" to an Institute supplier. Demand the Institute Label on every bale or carton.

The Sanitary Institute of America consists of ninety-five wiping cloth processing plants located in twenty-one states, also Canada.

MEMBER
The Sanitary Institute of America
COPYRIGHTED
The misuse or transferring of this label to any other package or bale is a misdemeanor, and the party doing so is subject to prosecution.
Correct Weight Guaranteed

Write for complete list of members.

THE SANITARY INSTITUTE of AMERICA

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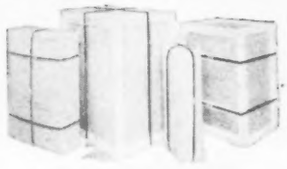
BOXES • BUNDLES • BALES • CARTONS • PACKAGES • CARLOADING

FOR EVERY TYPE
OF SHIPMENT...
PLANNED
PROTECTION

SKIDS


BUNDLES AND CARTONS

CARLOADING EQUIPMENT

CRATES

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Specially lithographed Signode Seals provide quick identification for shipments—and valuable advertising. Special seals can be made up in combinations of yellow, red, black with individual trademark or name.

Signode's shipping protection provides a specialized tool, strapping and application for all types of shipments from small packages to cartons, boxes, bundles, crates, bales, skids and bulk loadings . . . Net results are lower costs, greater security and freedom from damage in transit. Shippers, carriers and consignees alike endorse the Signode System of Steel Strapping.

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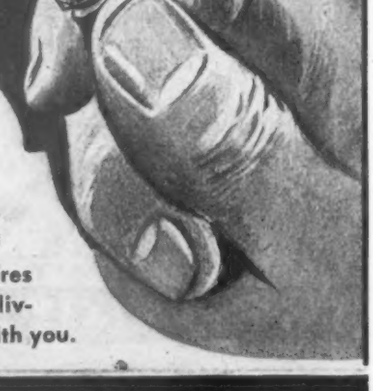
We Specialize in
ALUMINUM
SCREW MACHINE PRODUCTS



One of the trickiest, most difficult metals to drill, thread, turn and slot is aluminum. Considerable experience is required to insure a clean, well-finished product of accurate size. Fortunately, a good part of our past experience has been devoted to the "taming" of this shrew among metals! So if your product requires aluminum screw machine products — and reasonable deliveries will suffice for the time — we should be glad to figure with you.

NEWTON SCREW MACHINE PRODUCTS
THE NEWTON MANUFACTURING CO., PLAINVILLE, CONN.

ARMSTRONG ARMIDE *Carbide* TOOL SETS

CARBIDE-TIPPED TOOLS FOR EVERY DAY OPERATIONS

ARMIDE TOOL SETS simplify many everyday jobs in tool rooms, shops and maintenance departments. They are standard, multi-purpose tools which offer special advantages on machining operations involving: (1) Long runs, (2) High speed operation, (3) Cast iron, (4) Tough alloy steels, (5) Non-metallics, (6) Hardened parts (obviate need for annealing and re-hardening).

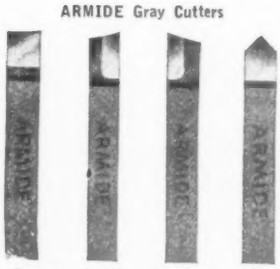
Each set comprises: 3 ARMSTRONG Carbide TOOL HOLDERS, 8 ARMIDE Carbide-Tipped Cutters — 4 ARMIDE Red, for machining steel and 4 ARMIDE Gray, for machining Cast iron, brass, bronze, aluminum and non-metallics; with service wrench in a fitted steel case. (as illustrated).

Straight Shank

Left-Hand Off-Set

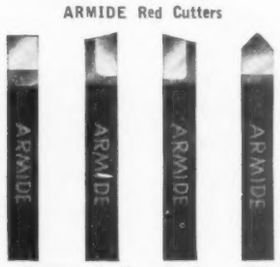
Right-Hand Off-Set

ARMIDE Gray Cutters



Square Nose | L. H. Off-Set | R. H. Off-Set | 80°

ARMIDE Red Cutters



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ARMSTRONG-ARMIDE Sets are stocked by leading Industrial Distributors in 4 sizes.

Write for Bulletin

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GARLOCK 117—furnished either braided or twisted in all sizes from 1/16" to 3/4".

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Garlock 117 Valve Stem Packing, like other Garlock products, is manufactured completely in the Garlock factory and is *quality controlled* from raw material to finished product. Each ingredient, each process, each operation is checked to conform with established Garlock standards.

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THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK
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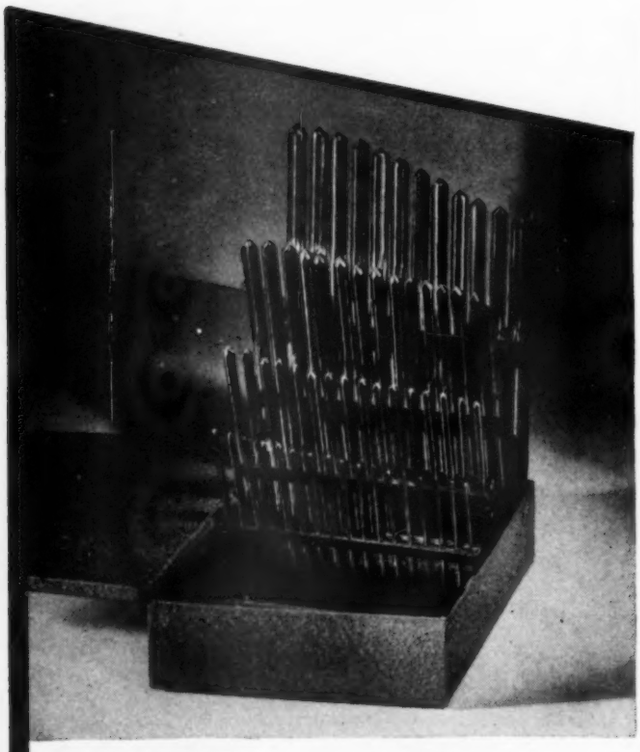
GARLOCK



A Standful of Better Production

This matched set of sixty L & I Ground Flute Reamers in Wire Gage sizes is only part of the L & I Line of Better Reamers.

They're better, because L & I specializes in ground flute reamers — ground *after* the solid bar is heat-treated and uniformly hardened. This gives a perfect cutting edge that stands up far longer than ordinary milled flute reamers.

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Place a trial order today and join the long list of leaders who are cutting costs and improving work quality with L & I Ground Flute Reamers.

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CHICOPEE, MASSACHUSETTS

2

L&I GROUND FLUTE REAMERS

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There are more than 50 of these Gleason Generators in the spiral bevel gear department.

THE next time you have a tough problem on the production of gears, differentials, splined shafts or allied items, check with FAIRFIELD

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GLOVES
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Tests show Surety Sureseal Synthetic protects hands 14 times longer than other synthetics or natural rubber. Proof against acids, oils, solvents, all skin-irritating liquids. Patented TURN-CUFF gives extra protection, keeps liquids from running down arms. Surety TURN-CUFFS are hard to snag, resist abrasion. Get Surety for safety!

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Waterproof Clothing that fits the job

You can count on this: "U. S." KNOWS HOW TO MAKE WATERPROOF CLOTHING! The science and craftsmanship that build "U. S." Industrial Clothing and Footwear and the quality of the rubber compounds used are backed by 100 years of "U. S." experience. It all adds up to long lasting, abrasion resisting clothing *that fits you on the job.*

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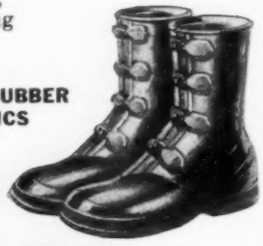

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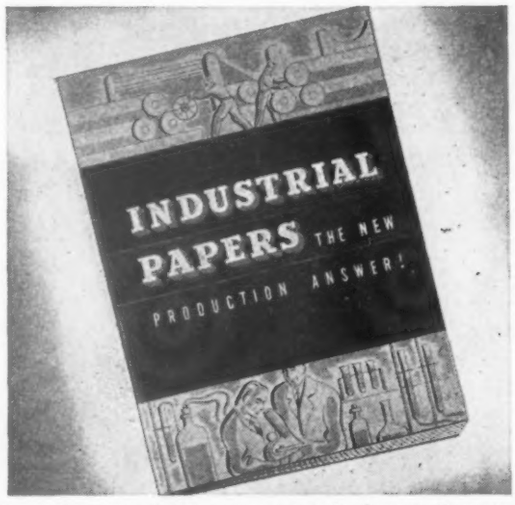

If you have asked "How can *paper* fit the manufacturing picture," you'll find the mystery cleared up in this book which tells how technically treated paper can replace hard to get and more expensive materials, increase production and improve products. For over 40 years we have been designing and building unusual papers for industry — why not put our laboratories to work on your problems. Write for free book — "Industrial Paper — The New Production Answer."

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No Shortage Here!

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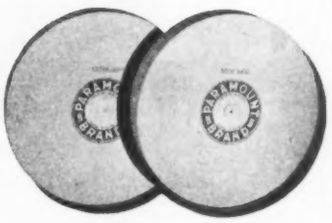

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Why not try them?

Order a trial lot of Paramount Brand Felt Wheels through your local supplier. These wheels are made by Bacon — America's oldest felt manufacturer.

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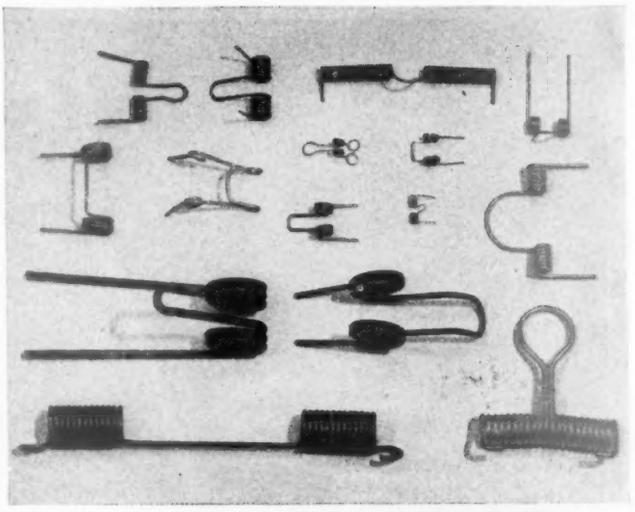

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At Reliable we have adopted an almost infallible system of *quality control*, which assures uniformity within very close tolerances. Of course correct design, by your engineers or ours or both, is fundamental. Of course selection of exactly suitable materials, with respect to metallurgical properties, and their reactions to corrosion, atmospheric changes, and electrical conductivity, is indispensable. Accurate heat treating and tempering are also essential. But once these factors have been determined, a *production method* that virtually rules out any considerable deviation from a uniform standard is all-important. Reliable's *quality control* process is mathematically worked out to do this, and you may rely on the uniformity of Reliable springs.

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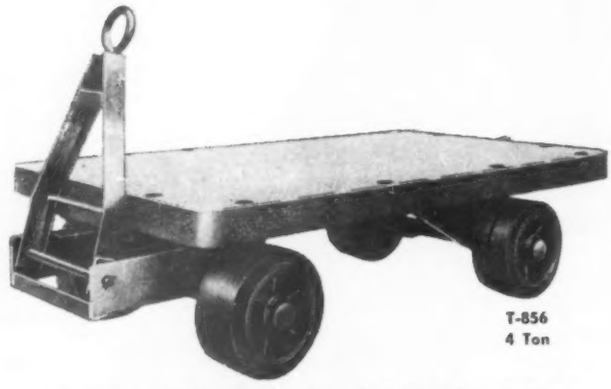

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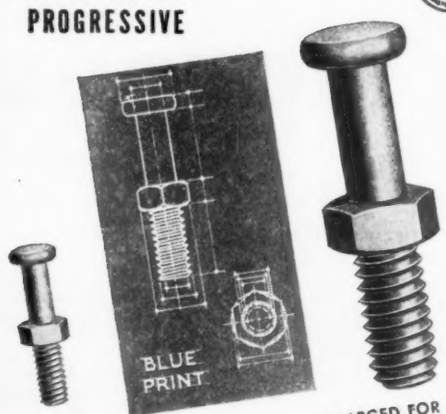

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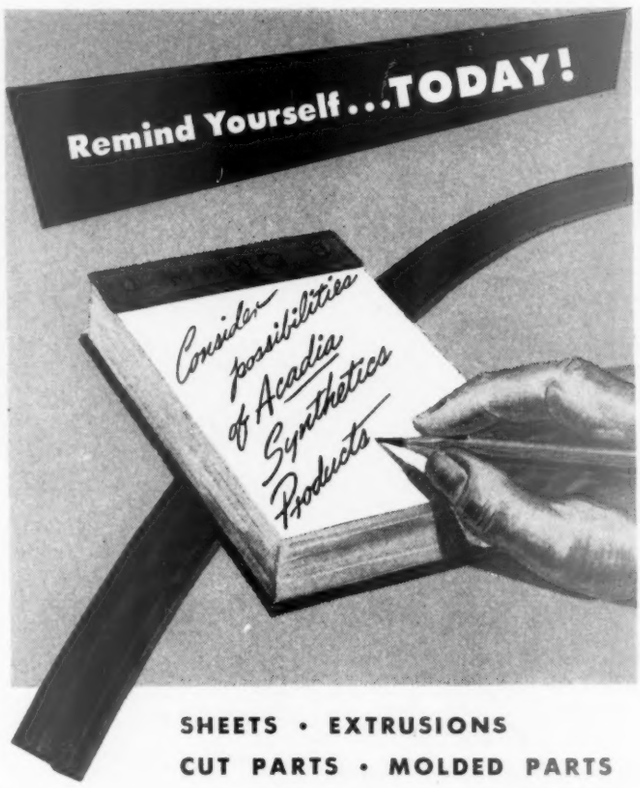
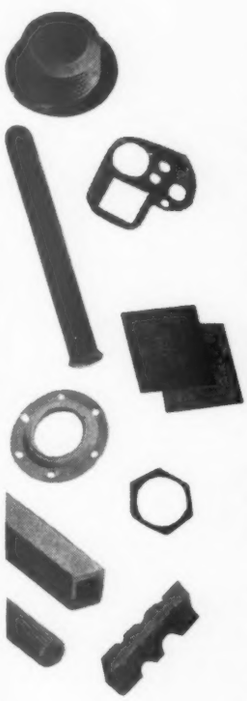
The **PROGRESSIVE MFG. CO.**

42 Norwood St. Torrington, Conn.



SHEETS • EXTRUSIONS
CUT PARTS • MOLDED PARTS



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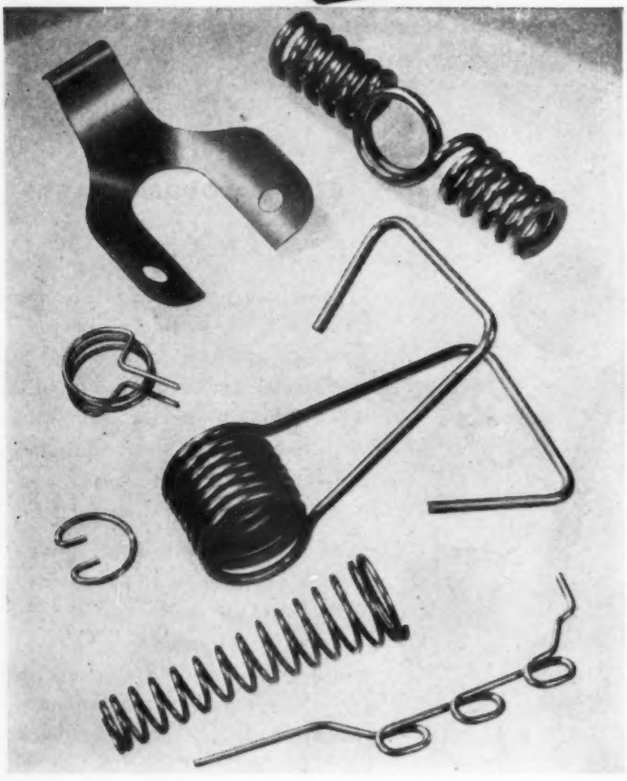

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Because—

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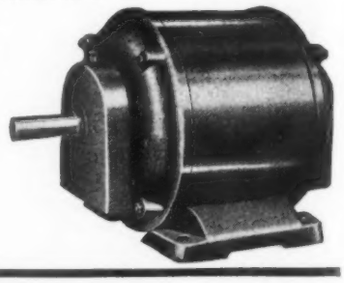

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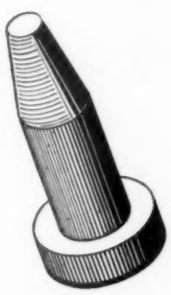

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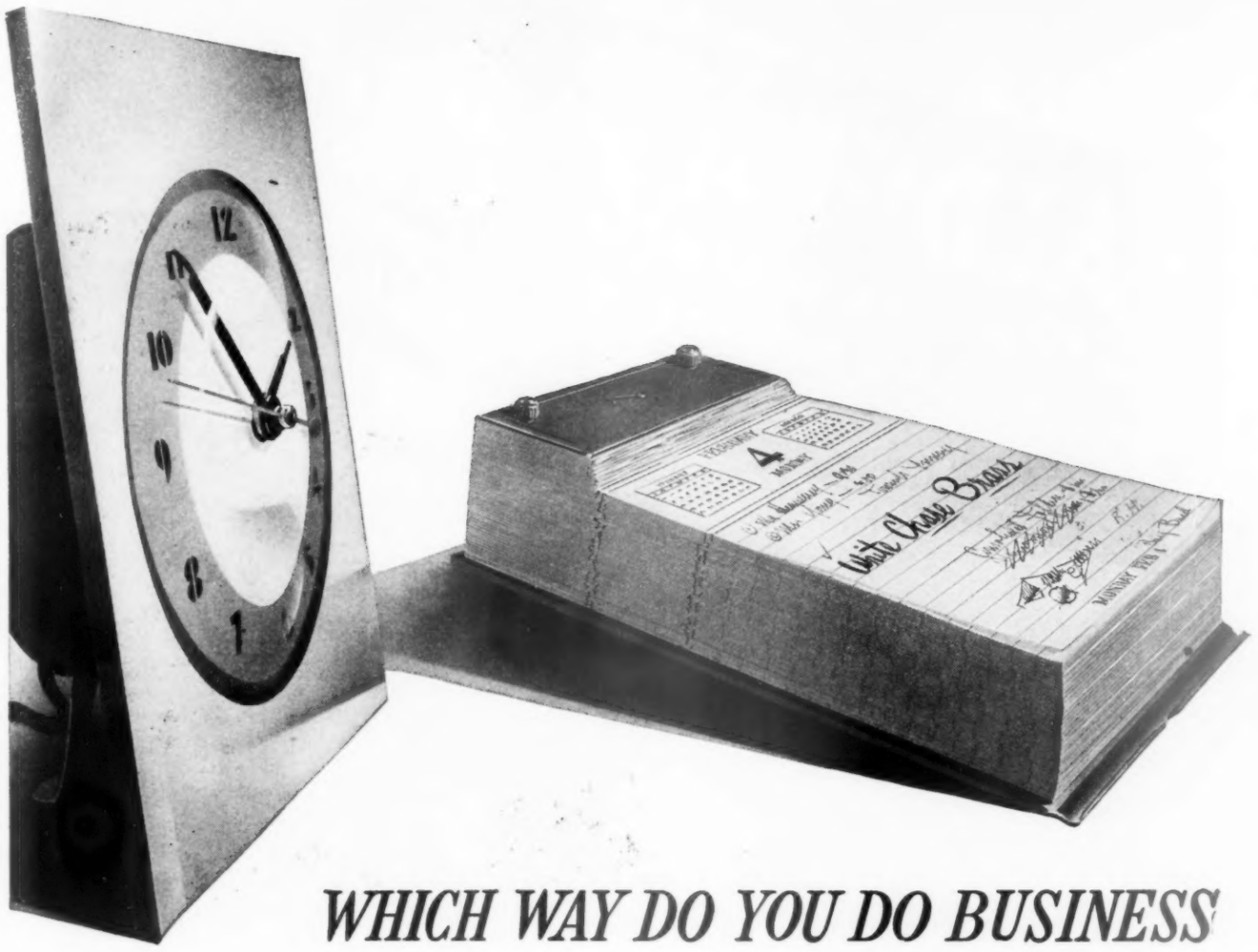

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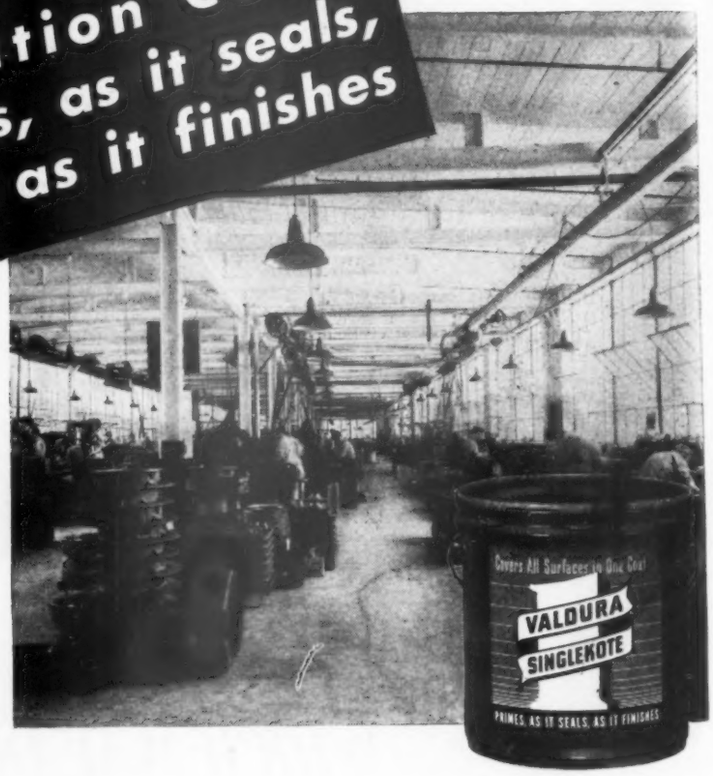

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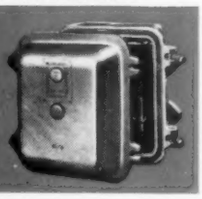
NEMA TYPES III and IV **WATERTIGHT and DUST-TIGHT CAST-IRON ENCLOSURE**		**WET LOCATIONS** • Docks • Canal locks • Subways • Tunnels • Dairies • Breweries
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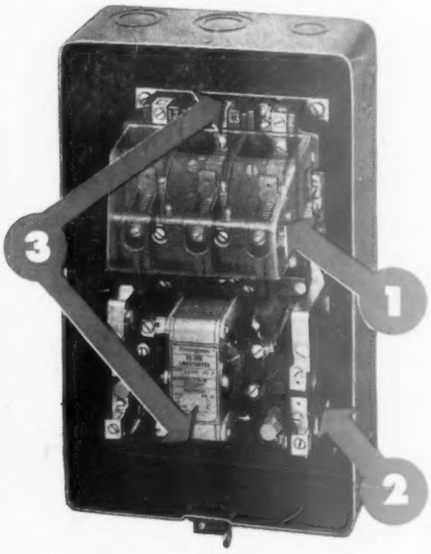

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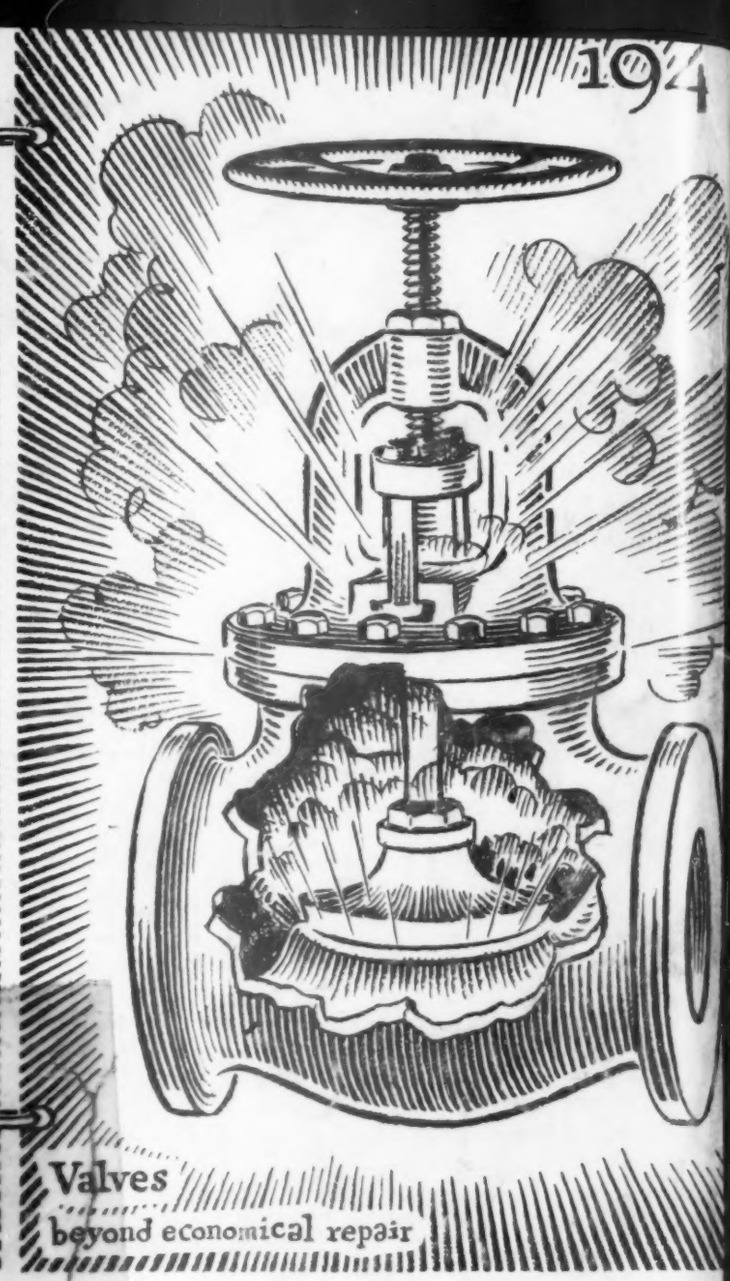

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